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A YEARLY REPORT OF THE PROGRESS OF THE GENERAL
SANITARY SCIENCES THROUGHOUT THE WORLD.

EDITED BY

CHARLES E. SAJOUS, M.D.,

AND

SEVENTY ASSOCIATE EDITORS,

ASSISTED BY

OVER TWO HUNDRED CORRESPONDING EDITORS, COLLABORATORS,
AND CORRESPONDENTS.

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PHILADELPHIA,

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Dermatologist to the Howard Hospital.

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BY CHARLES A. OLIVER, A.M., M.D.,
PHILADELPHIA,

Attending Surgeon to Wills Eye Hospital; Ophthalmic Surgeon to the
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Formerly Physician-in-Charge of the Laryngological Department of the
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Physician for Diseases of the Throat in the Massachusetts General Hos-
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DISEASES OF THE SKIN.

BY ARTHUR VAN HARLINGEN, M.D.,

PHILADELPHIA.

Burns.—H. Threlkeld-Edwards⁷⁸⁷_{Oct. 22, '92} states that in the local antiseptic treatment of burns the parts around the burn should be shaved of hair and washed with warm water and *sapo viridis*. All loose epithelium being removed, the surface is drenched with 1-to-40 carbolic solution or creolin 1 per cent. Following this, the parts are to be dusted with aristol and dressed with sterilized gauze and aseptic towels. Burns of the third and fourth degree should be dressed every day. Usually, when large areas are involved, it is well to examine the urine by nitric acid occasionally for albumen.

Nankivell²_{Oct. 22, '92} reports a case of burning by electricity. A "lineman" had his left thumb and forefinger charred and blackened. There was an eschar on the dorsum of the hand to the end of the ulna, and on the palm to the ball of the thumb and metacarpal joint of the forefinger. The tissues were actually burned to the bones and insensible to the touch. Four toes of the left foot were also burned on the plantar surface. The eschars were the size of a three-penny piece.

Dermatitis Exfoliativa.—O. Baker¹⁰⁵⁵_{Aug.} refers to a case of this affection in which the eruption was entirely cured in about twenty-three days, although the treatment seemed to have no effect upon the course of the disease.

Dermatitis Medicamentosa.—Rasch, of Copenhagen,⁴¹_{Sept. 11} describes symptoms of arsenical poisoning, consisting of headache, dryness of the mouth, anorexia, haematemesis, insomnia, and weakness, in a woman, aged 63, who had been taking 0.009 gramme ($\frac{1}{7}$ grain) of arsenious acid daily for one year. In the pectoral region there existed a gangrenous zoster, and the greater part of the body was covered with an eruption of ecthyma pustules, which rapidly became ulcers and greatly resembled a pustulo-

ulcerous syphilide. The epidermis of both palmar surfaces, which had remained unaffected during a previous skin disease, was thickened, resembling ribbed leather in appearance, and grayish-brown in color. After discontinuing the arsenic the ulcers healed and the changes on the palms disappeared; pigmented cicatrices, however, remained; debility, pains in the epigastrium, and a painful anaesthesia of the right leg persisted for a long period. According to Rasch, zoster and affections of the palms of the hands and plantar surfaces of the feet have frequently been observed to follow the administration of arsenic; at times a simple exfoliation of the epidermis without thickening, and at times a genuine keratosis with a smooth or warty, uneven surface. He is inclined to regard the ecthymatous eruption, taking the concomitant circumstances and the course pursued into consideration, as being due to the same cause, although he has been unable to find exactly similar observations in the literature of the subject. In another case of a phthisical subject, who had taken 18 drops of Fowler's solution in two days, a bullous dermatitis, unaccompanied by fever, appeared on the hands, feet, and knees, and also on the chest, back, and genitalia. The vesicles varied in size from a pea to a hen's egg, and were situated on slightly-raised red spots; they soon disappeared after the arsenic was discontinued. Rasch asks whether the vesicular eruptions, which sometimes appear in lichen planus, and considered as very remarkable, are not possibly due to the usual administration of arsenic in this disease,—a possibility which the various authors who have reported such cases have evidently never taken into consideration. He also mentions pigmentations suggestive of the bronzing seen in Addison's disease, particularly as the general symptoms occurring in this affection resemble those of chronic arsenical poisoning in a marked degree; and, further, erythematous and squamous exanthemata, resembling rötheln, scarlatinoid or erysipelatoid in character, often distributed universally. He believes that a part of the exfoliating erythrodermia, which sometimes occurs in psoriasis, pityriasis pilaris rubra, lichen planus, pemphigus, and eczema, may probably be due to arsenical intoxication. Eruptions resembling urticaria and œdema, particularly of the eyelids, and falling of the hair are of frequent occurrence. Herpes genitalis and labialis have been observed to follow the ingestion of arsenic, and several authors have

reported papular exanthemata, purpura, deformities, and loss of the nails after the use of the drug.

In a case of arsenical poisoning, reported to the Society of Physicians in Styria by Müller, the patient, a man aged 43, had the following symptoms: Sensibility, tactile sense, and sense of pain were decreased; the temperature sense remained normal, and disturbances of secretion (hyperidrosis), both vasomotor and trophic, were present. The epidermis became loosened in some places in large, ragged pieces, and in some places branny exfoliation was noticeable. The history of the case revealed the fact that the man had taken the poison with suicidal intent. Müller considers the prognosis as favorable; the symptoms usually improve in about six months. The treatment consisted of diet, mild faradization, baths, and good air. R. D. Murray^{Oct. 22, '92} reports a case interesting in several respects. A box arrived by rail in Patna (Bengal), which emitted a bad odor and leaked at the cracks. On opening the box in the presence of Dr. Murray, the body of an adult female Mohammedan, wrapped in paper, was discovered. Decomposition had progressed considerably; the odor, however, was relatively not intense. On external examination the epidermis was seen to be exfoliated, red and green spots were noticeable in some places, and the vagina and rectum were prolapsed. With the exception of an ecchymosis on the forehead and thorax, no positive signs of an external injury were perceptible. The meninges of the brain were livid in color and the brain itself in a state of decomposition. On opening the other cavities, the organs, particularly those of the abdominal cavity, were found to be surprisingly fresh and well preserved, and free from putrid odor. The lungs were partly collapsed, and floated on water; the heart was softened and empty, the cardiac valves normal. The endocardium of the left ventricle was of a peculiar light-yellow color, which extended over one-third its circumference, and had the appearance of having been dusted with pulverized iodoform. The peritoneum was congested and of a light-red hue, particularly in the region of the stomach, and ecchymoses were scattered over its mucous membrane; the stomach contained a quantity of reddish-brown fluid; the intestinal canal was in a congested state throughout its entire length, contained a light-yellowish, odorless fluid, and no faeces. The liver and spleen were healthy, the kidneys of a deep red, the bladder empty; the rectum,

uterus, and vagina were prolapsed. The chemical examination of the stomach and contents, and of the heart, parts of the rectum and contents, and of fragments of solid organs, verified the suspicion of arsenical poisoning. The points of greatest importance in this case were: (1) the high state of preservation of the internal organs in comparison to the decomposition of the external ones; (2) the surprising and total absence of putrid odor of the contents of the stomach and intestines; (3) the excessive congestion of the organs of digestion and of the peritoneum; (4) the presence of light-yellow, odorless liquid in the intestinal canal and the small mineral particles floating therein, which were at once recognized as yellow arsenic; (5) the precipitate of arsenic sulphide in the endocardium, which, according to Murray, has never before been observed at this place in a case of arsenical poisoning. The dose of arsenic must evidently have been very large in this case, and was probably combined with turmeric, which is used very frequently in India as an article of diet. The murderer, who was discovered later, also admitted having administered yellow arsenic to the woman.

Von Gram ³⁷³_{v.s.p.655} calls attention to the frequent presence of arsenic in articles of daily use. In 412 tests in the last two years, 91, or 22 per cent., contained arsenic; of 186 pieces of wall-paper examined, 26 contained arsenic, 19 only traces; of 44 wall-paper borders, 30 contained arsenic, 14 only traces; of 78 fabrics and ribbons, 17 contained arsenic; of 17 artificial flowers, 3 contained much arsenic; of 50 green candles, 15 contained much arsenic; all of these last samples, however, were obtained from the same factory. A number of Japanese articles were also examined and were very frequently found to contain arsenic.

A. Hersfeld ⁵⁹_{Aug.19} records a case of dermatitis following the use of iodoform bougies, each of which contained Rx iodoformi, 1 gramme ($15\frac{1}{2}$ grains); butyrum cacaonis, 3 grammes (46 grains). The eruption was noticed after six of these bougies had been used. The parts healed, and the man, on resuming use of the discarded garments, was again affected, it being found that some of the iodoform remained upon them. J. Abbott Cantrell ⁹_{Jan.7} refers to two cases where a decided dermatitis followed the use of iodoform on denuded surfaces. One case had been dressed after a surgical operation with iodoform; the other individual used it of his own accord upon an eczematous eruption.

Dermatitis Herpetiformis.—Stephen Mackenzie⁶⁹⁷ calls the dermatitis herpetiformis of Duhring a cutaneous neurosis, and surmises it to be a peripheral neuritis and due to a parenchymatous inflammation; although, in some cases, it may be a functional affection. The excitation of the disease by pregnancy and uterine disease again suggests a reflex neurosis. A neuropathic disposition no doubt plays an important rôle in the production of the disease. As to treatment, a sedative is often necessary in the first instance, and Mackenzie usually finds chloral best, although he sometimes has recourse to opium. When it is necessary to give a sedative in the day-time, he has had the best results from 10 to 20 minims (0.65 to 1.3 grammes) of the tincture of cannabis Indica, administered three times a day. Antipyrin is sometimes of great service, especially when there is a predominance of urticarial phenomena. It is best given at bed-time or in the evening, in doses of 20 to 30 grains (1.3 to 2 grammes). Of all drugs which exercise an influence over the disease, arsenic, suggested by its marked influence on pemphigus, stands in the first rank. Full and increasing doses to the limit of toleration should be given. In a few cases it appears to be curative, in others it controls to some extent the disease, whilst in others it entirely fails. Quinine in full doses has occasionally appeared of service. Saline purgatives and diuretics have in a few cases appeared to do good, and alkaline tonics have been of service in improving the digestion when that has been at fault. Locally, continuous swathing with diluted glycerole of lead has been found by Mackenzie to be comforting to the patient. Sulphur ointments, as suggested by Duhring, seem to give relief in some cases.

Eczema.—Saalfeld,¹¹⁶ in the acute stage of eczema, employs equal parts of lead-water and boracic-acid solution, 3-per-cent. strength, the two fluids to be freshly mixed every time, and renews the applications every ten to fifteen minutes, which are not to be supplanted by any other applications, except when circumstances render their employment impossible. He also sometimes substitutes for this mixture a solution of boracic acid alone, particularly when preparations containing sulphur or mercury (in particular, *ung. hydrarg. ammon.*) have been previously employed. In polyclinic practice he uses, for purposes of economy, applications of lead-water alone; in some cases 1-per-cent. solutions of thymol or 1- to 2-

per-cent. liq. aluminii acetici were substituted for the boracic solution and lead-water. During the intervals in which the applications had to be discontinued ointments or dusting-powders were used; in some cases the latter could not be borne at all, as they interfered with the sleep of the patients. In some cases, in which sleep was impossible, talcum was employed; in others, lanolin, bor-lanolin, thilanin, or, in polyclinic practice, leaf-lard, expressed fresh daily. This moist treatment of acute dermatitides is persistently carried out until cure results, and in eczema until the squamous stage is reached. Saalfeld includes those forms of dermatitis which have been irritated by severe external applications and are not typical eczemas. He also states that very good results are obtained by this method in the treatment of artificially inflamed sycosis vulgaris, in acne vulgaris when irritated by the patient, and in psoriasis and many other skin diseases which have been aggravated by external influences.

Ravogli,⁵³ in the case of an eczema rubrum of the legs in an old lady, applied first a liniment of 2-per-cent. ichthylol in glycerin, rose-water, sweet almond-oil, and lime-water, on English lint, the whole being covered with cotton. This had a wonderful effect on the sore surface. The scales loosened, the redness diminished, the serous discharge grew less, the epidermis began to cover the surface, and the burning sensation was greatly relieved. The treatment was finished by applications of benzoated oxide-of-zinc ointment. In a case of infantile eczema a similar liniment was used with good effect. In other cases a stronger liniment was used, and sometimes ung. diachyli (Hebra) with 6 per cent. of ichthylol. Ravogli also gives ichthylol internally in tea, in doses of 30 to 60 drops per day.

Erythema.—McCall Anderson³⁶ gives the clinical appearances of the erythematous eruptions of the skin, with a short account of their differential diagnosis.

Framboesia.—Charlouis Samarang¹⁷⁴ advises the name of "polypapilloma tropicum" (already proposed by him some years ago) for this affection, so that it may be understood what disease is meant. He gives a thorough account of the affection, and believes that other than Africans may be affected, several instances in children of European parents being cited. From experiments, he comes to the following conclusions: (1) that it is contagious,

being both auto- and hetero- inoculable; (2) that the same person may have more than one attack; (3) that the period of incubation is from three to five months; (4) that there is considerable fever preceding the eruption. He has never known a fatal case of this affection; cases which ended fatally were sufferers from other diseases, which were the cause of death. Samarang states that mercury and iodide of potassium alone have much influence on the course of the disease, although he does not believe it has any connection with syphilis. E. Pontoppidan ¹⁷⁴ _{Oct., '91} believes framboësia to be a disease having its seat in the rete Malpighii; that is, that it is superficial, and does not form the destructive ulcers which are said to be found under the crusts. The writer states that the affection was so bad in San Domingo in 1879 that those affected were isolated, and even those who came into contact with them were affected. Pontoppidan is of the opinion that it is most probably parasitic. Beaven Rake ⁶⁹⁷ _{Dec., '92} gives the post-mortem appearances in several cases of lepers dying in the Trinidad Leper Asylum, who had suffered also from framboësia. He failed in each case (four in all) to find any symptoms of visceral syphilis. In two cases the internal organs were healthy, while in the other two there was visceral tuberculosis. In one case the spleen contained yellow masses about one-fourth inch in diameter under the capsule. In view of the fact that the other viscera were tuberculous, these growths were probably large yellow tubercles.

Herpes Zoster.—W. F. Waugh ⁷⁶⁰ _{Oct., '92} refers to a case of herpes zoster occupying the course of the sciatic nerves, viz., groin, buttocks, along the anterior crural nerve, and the glans penis. The temperature was 104° F. (40° C.). The case was cured by the local application of europhen in petrolatum; phosphide of zinc, 1 grain (0.065 gramme), being given in the course of twenty-four hours internally.

Leprosy.—Joseph Winiarski ²¹ _{Oct. 8, '92} examined the blood of seventeen leprous patients, in various stages of the disease, with the aid of von Fleischl's hæmometer and Thoma-Zeiss's counting apparatus, and concludes that, when leprosy has not given rise to great changes in the organism, the composition of the blood is not much altered. No change in the composition of the blood in the various forms of leprosy (anæsthetic, nodose, and mixed) can be demonstrated. In some recent cases he even found the number of blood-

corpuscles a percentage of haemoglobin above normal. In chronic cases the number of blood-corpuscles was always found to be diminished, on an average, 17.9 per cent. in men and 12.3 per cent. in women. The haemoglobin was decreased, on an average, 6.3 per cent. in men and 2.4 per cent. in women. In recent and less-grave stages of leprosy, therefore, it appears that the blood does not undergo marked alterations; but when it has spread over the entire body, and the form is grave, the vitality of the blood becomes markedly impaired, and such alterations occur as are seen in the gravest forms of essential anaemia. The white blood-corpuscles were usually normal in quantity, with the exception of one case, in which they were in excess. In all cases of leprosy Winiarski has noticed a large preponderance of multinuclear leucocytes. The red corpuscles, as a rule, retained their normal diameter; the microcytes and blood-corpuscles, having a diameter of 9218μ to $10,056\mu$, were somewhat more numerous than is normally the case. Winiarski adapted, in his researches, the figures given by Neubert as normal, thus: 1. Normal number of red corpuscles contained in 1 cubic millimetre of blood, in men, 5,596,000; in women, 5,100,000. 2. Normal number of leucocytes in 1 cubic centimetre of blood, 5000 to 10,000; normal proportion of the uninuclear to the multinuclear leucocytes, 45.4 to 54.6. 3. Normal value of the relative haemoglobin estimate of the blood, in men, 105 of the scale of von Fleischl's haemometer; in women, 95 of the same scale.

W. Gillmore Ellis⁶ records the case of a boy, 12 years of age, in whom there was an ulceration of the lobe of the left ear. A suspicion of leprosy caused the writer to pinch the ear and draw serum, which, upon microscopical examination, showed lepra bacilli. The boy had been in the habit of playing near the house of a leper. There were anaesthetic spots over the left side of the body.

Carreau,²⁶ observing that in a leper who was bitten by a rattlesnake a manifest diminution of the leprous tubercles took place before death, twenty-four hours after the bite, and recognizing the fact that the acknowledged result of inoculation of serpent-poison was to produce a condition of methaemoglobinæmia, indicated by black fluid blood, jaundice, internal and external haemorrhages, determined to try the effects of heavy doses of potassium chlorate. He gave from 150 to 300 grains (10 to 20 grammes) of the drug daily for three days, producing grave symptoms of poisoning there-

with, but after the disappearance of these symptoms the leprous tubercles almost entirely disappeared, leaving the skin soft and wrinkled.

Lipomata.—Socin²¹⁴ _{Oct. 15, '92} presented two cases of symmetrical lipomata of the nucha and neck, which had developed in two years in two men, aged 42 and 46 respectively. Only thirty-four cases of this rare disease, which was first made known by Sir Benjamin Brodie in 1846, are recorded in literature. Socin thinks that the affection deserves attention not only on account of the symmetrical arrangement of the tumors, but particularly on account of their very typical location on the occiput, nucha, and neck. In referring to the excellent description by Madelung, he adopts the name of "fetthals" (an accumulation of fat about the neck), as suggested by that author, and calls attention to the remarkable symmetry in form and location of the tumors. In both cases the occiput and nucha were occupied by a quadrigeminal body, whose upper pair, separated by a deep vertical furrow, did not extend beyond the external semicircular line of the occipital bone in the middle, and reached laterally beyond the mastoid processes to one centimetre from the insertion of the auricle. The lower pair of protuberances were situated on the nucha, and the upper were divided from the lower pair by a deep and broad transverse furrow in a line with the sixth cervical vertebra, and showed a less-marked central excavation. Anteriorly on the neck there existed soft masses of fat, having the shape of an immense double chin, extending from the inferior maxilla to the sternum; from this double chin branches ramified posteriorly on both sides upward to the lobe of the ear. Both supra-clavicular fossæ contained large plicæ adiposæ. In the abdomen and back smaller symmetrical collections of fat were present, but no other signs of corpulence. According to Socin, these lipomata are of different consistence, grow more or less rapidly, but are always diffused, and spread subcutaneously and beneath the fasciæ and between the muscles without being sharply defined. These conditions render extirpation quite difficult, and injuries to the nerves are almost unavoidable when operating; consequently the operation is only indicated when dyspnœa or dysphagia exist, which, however, occur rarely. The etiology is obscure, as is the case in all formations of tumors, and the theories advanced up to the present date are unsatisfactory. Curling

attributes—and probably falsely—the affection to disease and atrophy of the thyroid gland. Baker suspects disease of the lymphatic glands. Grosch endeavors to prove that lipomata and abnormal formation of fat usually occur where the least number of sebaceous and sudoriferous glands are found, and agrees with some physiologists that these glands produce, together with the decomposition products of tissue-change, fat and its derivatives and conduct them to the skin. The symmetry points to neurotrophic influences, with the nature of which we are as yet totally unacquainted. It is certain, however, that the "fetthals," in the shape just described, is an acquired disease of adults, exhibiting an entirely typical repeated arrangement and localization of abnormal collections of fat, independent of general corpulence. Up to the present date the affection has been observed only in men, whereas the circumscribed lipoma occurs oftener in females, and diffused solitary lipomata of the neck are not infrequently congenital. The majority of the men thus affected were addicted to alcoholic drinks, as were these two individuals in a marked degree. In the discussion of this paper Socin remarked that treatment with arsenic had been instituted in one case. Massini stated that inunctions with unguentum cinereum had answered well in a case of simple lipoma; in Socin's cases he would recommend energetic inunctions with *sapo viridis*. The tumors reminded Kollmann of the symmetrical fatty organs of certain animals. Schneider was of the opinion that preparations of potash and soda would be advisable. Socin also remarked that these lipomata frequently change their consistence, and that they are not affected, or only very slightly so, by typhus, carcinoma, and other wasting diseases.

Lichen Planus.—Page ¹⁴_{Jan. 15} describes the happy results in his own case of the hot-water treatment advised by Jacquet for generalized lichen planus. The itching was so intense that sleep was impossible, even with 8-gramme (2 drachms) doses of chloral, or 0.04-gramme ($\frac{2}{3}$ grain) doses of morphine. After a third hot douche, sleep was obtained with 2 grammes ($\frac{1}{2}$ drachm) of chloral, and at the end of eight days the itching ceased, to begin again only on days when the douches were omitted. Besnier remarks, however, that certain forms of lichen are not amenable to this treatment.

Lupus Erythematosus.—Hutchinson ⁸⁰⁶_{Apr.} speaks of a case of

lupus where erythematous congestion (lupus sebaceus) alone exists, comedones being also present (case from Hebra's atlas), and regards the condition as a connecting-link between lupus vulgaris and lupus erythematosus, the disease remaining limited to the nose a long time and rarely assuming a bat-wing form. [This unfortunate suggestion is one of those superficial generalizations which shows that, no matter how eminent an observer may be, nor how great may have been his opportunities for observation, he cannot afford to isolate himself from his fellow-students. Much of Hutchinson's work is of no avail because he prefers his own private views and nomenclature and ignores the work of others.—A. V. H.]

Lilienfeld ²¹³⁴_{Mar. 12} reports a case of lupus erythematodes in a woman, aged 46, in whom a general catarrhal condition of both lungs developed. He regards the concurrence of the pulmonary affection of interest, as Veiel has already called attention to the co-existence of tuberculosis with lupus erythematodes. [A "catarrhal condition" of the lungs does not, however, necessarily indicate the presence of tuberculosis.—A. V. H.]

Lupus Vulgaris.—Crocker ¹⁰⁷⁷_{Dec. 7, '92} gives an interesting account of a case of ulcerating lupus in a strumous subject. The lesion was situated upon the nose, the left nostril being entirely destroyed, the columnella almost gone, and the right nostril far advanced in ulceration, the raw surface being covered with exuberant pus-secreting granulations. The other soft parts were unaffected. Upon the right side of the orbit and cheek was a large flat scar, within which there was a characteristic lupous nodule. Under the chin was a suppurating crusted dermatitis, situated on a firm lump, evidently an enlarged lymphatic gland. Other evidences of struma were also displayed. Crocker expresses the belief that the pus cocci find the tissues of these subjects an especially favorable nidus, and that this accounts for the greater amount of destruction of tissue. He also regards lupus papillomatous and lupus verrucosus as strumous manifestations, the characteristic nodules being absent.

As a means of relief, Crocker advises that care be exercised in acutely inflamed cases, so as not to excite the disease to renewed action, external measures being the more satisfactory. He also believes that Koch's tuberculin will have no curative effect unless the diseased tissues are previously curetted. Thiosinamin, referred

to first by Hans von Hebra, seems not to have as great constitutional effect as the tuberculin.

Hutchinson ⁸⁰⁶_{Oct., '92} speaks of a case of lupus occurring on the arm of a syphilitic subject which he calls syphilitic lupus,—an unfortunate and confusing designation. The same author refers also to the infrequency of lupus at Nuremberg, Munich, and other parts of Bavaria. In Prague and Bohemia, on the contrary, it is very common. J. L. Milton ³⁶_{Dec., '92} publishes such irrational ideas of lupus that it would seem as if his article had been written thirty or forty years ago. Normann Walker ³⁶_{Feb.} wisely takes him to task for his denial of the existence of a tubercle bacillus, and says that all dermatologists are agreed that lupus, meaning *lupus vulgaris*, is a form of tuberculosis of the skin. Walker maintains the existence of the tubercle bacillus most strenuously, and proves distinctly its influence, stating that, with the exception of Jonathan Hutchinson and Allen Jamieson, those present at the late congress at Vienna were of the unanimous opinion that *lupus erythematosus* and *lupus vulgaris* were absolutely distinct. The treatment recommended by Walker is that recommended by all prominent dermatologists at the present day.

Another example of lupus and struma is spoken of by Hutchinson, ⁸⁰⁶_{Oct., '92} wherein the patient, a boy of 10, had persistent lupous ulceration with scars covering his fingers,—the ring finger shortened from necrosis, a patch of superficial lupus on the middle of right cheek, and a larger one on the left forearm. There was opacity of the left cornea following ulcers. The disease was of long standing. Injections of tuberculin were followed by great benefit, and, while it could not be said that the lupus was cured, it was reduced to quiescence. Hutchinson ⁸⁰⁶_{Jan.} refers to an extraordinary case of acute erythematous lupus consequent upon the appearance of erysipelas in a lupous subject.

J. William White and Alfred Wood ¹_{Feb.} report the cure of a case of lupus of the face in a man, 59 years of age, in whom six injections of paratoloid had been made in the course of three weeks. The patient, seen two years after, showed only a cicatricial scar and no points of acute inflammation.

Under the title *lupus tumidus* ⁸⁰⁶_{Jan.} Hans von Hebra and Lang record two cases (the models of which were shown in the Congress museum) in which there was an elephantiasic condition of the

part. Hutchinson believes the title "lupus elephantiasis" to be a better one for the condition.

Lang⁵⁷ _{Apr. 30} considers the usual methods employed in the treatment of lupus, such as scraping, cauterization, applications of strong bichloride solutions, pyrogallop, etc., as unsatisfactory. According to him, only the most superficial affected areas and not the deep lupous foci are reached by these measures; consequently relapses usually occur. He gives the case of an extensive lupus involving the entire half of the face of a patient, aged 17, who had been afflicted with the disease since his fourth year, and had been treated unsuccessfully with all the different remedies,—even injections of tuberculin had been without result. An incision extending around the entire lupous area was made, and the affected tissue removed as far as the lupous foci extended; the wound was covered with skin-grafts according to Thiersch's method. The operation was very laborious, owing to the numerous ligations, fifty to sixty in number. A cicatricial cutis, which unites directly with the healthy skin, marks the place of the former lesion. The operation was performed in June, 1892, and a relapse has not occurred since. An ectropion of the lower eyelid, which had existed for some time, still remained; according to Lang, Thiersch's method of skin-grafting fails to relieve this condition.

Du Castel⁴⁰ _{Feb. 1} says that the ulcerative tendencies of lupus are especially pronounced in lymphatic subjects, but that they manifest themselves in various ways. The ulceration, while remaining shallow, may extend rapidly over the surface; this is lupus serpiginosus. It may extend in depth, while only invading inconsiderable areas of the surface; this is terebrating lupus. Finally, lupus may rapidly destroy large extents of tissue, increasing at the same time in depth and upon the surface; this is lupus vorax.

To the first form belongs in particular the dry tubercle, the tuberculous nodule of lupus planus. The second commences sometimes by a typical tuberculous nodule, which at a given moment breaks down and ulcerates, sometimes, and more frequently by a lesion with humid appearances. Du Castel regards lupus as essentially a local affection,—a local tuberculosis *par excellence*. While it may remain for years confined to the point where it first showed itself, cases are not rare (in his experience) in which serious, even dangerous, complications arise in patients attacked

by lupus, and they seem to spring up under the influence and as a consequence of the latter. Renouard observed 33 cases of pulmonary tuberculosis in 87 lupous patients. Leloir, in 17 lupous subjects, observed pulmonary tuberculosis in 10 instances. Bender observed, in 150 cases of lupus, 99 instances of present or anterior tuberculosis.

[Lupus (by which, of course, lupus vulgaris is understood) is so rare in the United States, while pulmonary tuberculosis is so common, that the clinical relationship between the affections has rarely awakened any attention. It might be well if all cases of lupus vulgaris occurring here were published, with a view of establishing this fact.—A. V. H.]

Lupus Pernio.—Tenneson¹⁴ _{Nov., '92} describes a case of lupus pernio (Besnier), so called from its resemblance to erythema pernio, or chilblains. Lesions occurred on the face dating back ten years, and on the hands dating back only three. Here and there amid the redness diffusely overspreading the face were seen lupous tubercles of the characteristic barley-sugar color, and near them cicatrices of former tubercles healed after ulceration. No traces of tubercles appeared on the hands. Histological examination by Quinquaud showed, in the lesions of the face, an excess of epithelioid but few giant cells, and none of the bacilli of Koch. The diffuseness of the lesions was due to a mucous matter infiltrated through and separating the cells. Nodules, however, occurred in the superficial vascular net-work, with accumulations of blood, and, lastly, numerous little cysts formed by the retention of the secretions of the sebaceous glands. Vidal remarked on the slow appearance of ulceration in this form of the disease, which he claimed to be a case of lupus of the superficial layer.

Melanosarcoma.—Plucker²⁰³ _{p.554} describes a case of melanosarcoma of the skin, remarkable for tardy generalization. The patient, a puddler, aged 52 years, has had from birth a small pigmented and verrucous nævus, as large as a pea, on the thorax below the left nipple. From constant scratching, pulling, or irritation during the patient's work, the tumor gradually increased in size, but despite a severe wound received in a fall, in 1883, occasioning a copious flow of blood, it caused little annoyance. In April, 1892, however, a second tumor appeared, above the left nipple; then others in various parts of the body. In June, 1892, the patient

came for examination, complaining for the first time of weakness and inability to work, but no pain beyond uneasiness in the epigastric region; appetite and digestion were good, sleep sound, no cough. The principal tumor was found to be about the size of an egg, irregular in shape, sessile, somewhat movable under the skin, firm and in places hard in consistency, of a blue-black color, changing to deep red in spots, and easily bleeding at superficial points of excoriation or ulceration. The first secondary tumor was of the size of a small nut, of a deep-blue color, and covered with a blackish crust. Other tumors, many of them subcutaneous, occurred elsewhere on the thorax, back, arms, neck, and cheek, perhaps one hundred in all. The inguinal and axillary lymphatic ganglia were somewhat distended, and the left lobe of the liver was enlarged and sensitive to pressure, but the lungs, heart, spleen, and kidneys showed nothing abnormal.

It was desired to try the effect of subcutaneous injections of Fowler's solution, but the patient refused to stay under treatment. In July he returned, complaining of loss of appetite, increased pain about the liver, and cough. Bronchitic symptoms were detected, but no sarcomatous metastasis in the lungs. He again refused to remain in the hospital, and, going to his birthplace, died there at the end of July, three months after the appearance of the first secondary tumor.

Melanosarcoma originates, usually, either in the choroid or in the skin, from a nævus irritated as in the case described. These tumors are characterized by the development of a brownish pigment, imparting to the neoplasm a gray, brown, or even black coloration, often unevenly distributed. Some writers claim that this pigment is formed at the expense of the coloring matter of the red globules of the blood; chemical analysis proves it to contain no iron, but a notable amount of sulphur. Generalization is now considered to take place by embolism of the blood-vessels. Thus secondary tumors are readily developed in the lungs, spleen, kidneys, liver, brain, walls of the intestines, and marrow. Infection by the lymphatic passages is possible, but less frequent. Another difference from carcinoma is that sarcoma has not so great a tendency to ulceration, as illustrated in the case cited.

Miliaria.—S. Politzer,²⁴⁵ Feb. believing that prickly heat has no connection with eczema, has made examinations of specimens

removed from patients of different ages, and from different portions of the body, and finds that the same conditions are present in all of his sections,—an edematous rete Malpighii, containing dilated sweat-ducts, with no change in the cutis except in the papillary layer, the horny layer of the epidermis being swollen by imbibition.

Molluscum Contagiosum.—Rieder ³⁴_{Jan. 17} presented the case of a man, 24 years old, with molluscum contagiosum of the hairy scalp, and emphasized the fact that a number of daughter-nodules had developed, radiating around the mother-node, which he regarded as a proof of their infectious parasitic nature. He also considers the location of the disease on the hairy scalp, which seems to be very rare, as very peculiar. According to Kaposi, molluscum contagiosum occurs only on non-hairy parts of the skin. The prognosis of the affection in human beings is always favorable, whereas in animals, as fowls, a fatal result is the rule (Bollinger). Simon and Levin recommend expression and scraping of the nodules with the sharp spoon, or, in anxious patients, the use of *sapo kalinus*. Kaposi succeeded in removing all molluscous warts by expression in one of his own children. Hutchinson ⁸⁰⁶_{Apr.} reports cases of molluscum contagiosum following the use of a Turkish bath, probably due to the uncleanly condition of the bath.

Kromayer ⁴¹_{Mar. 27} studied the histogenesis of molluscous bodies by a new method, which consists in staining sections $\frac{1}{20}$ millimetre in thickness, according to Weigert's method of staining fibrin, and extracting with aniline-xylol. The staining must be preceded by nuclear coloring with alum-carmine. On examining the sections microscopically, commencing at their periphery and proceeding toward their centre, a single layer of cylindrical cells was first seen; these contained a distinctly colored nucleus and epithelial threads (prolongations of the protoplasm), which were readily recognized. In the following layers the cells lost their regular shape, and the nucleus was not as readily stained. The epithelial threads were also observed to divide and become confluent in masses, and were partly transformed into protective substance or into kerato-hyalin. Meanwhile the nucleus had split up entirely, and the nuclear corpuscle alone had remained. While the nucleus had degenerated, the protoplasm had developed and become a transparent flake. Kromayer regards these characteristic corpuscles as undoubtedly changed degenerated cells, and thinks the

theory which attributes disease to the gregarina before their presence has been really proven is somewhat forced. Blaschko and Benda also regard the molluscous corpuscles as degenerated cells.

Mycosis Fungoides.—Hollopeau and Jeanselme¹⁴ Dec., '92 present a typical case of the mycosis of Alibert, remarkable for the size, violaceous hue, and confluence of the mycotic tumors on the face. One tumor as large as a hazel-nut occurred on the velum palati,—the only instance in which that localization has been recorded, aside from a case of sarcomatosis observed by one of the writers, and considered, without due proof, to be of a mycotic nature. Furthermore, a very decided sclerous induration existed in almost the whole external tegument, involving also the underlying cellular tissue; this was not the simple thickening remarked in the erythematous forms of mycosis. Histological examination of a small tumor from the face shows the existence in the derma of a reticulated tissue, the meshes of which were full of cells, rounded or polygonal from reciprocal pressure. A considerable dilatation of the small vessels explained the violaceous appearance of the neoplasms; and the obstruction of many of the vessels by endothelial proliferation accounts for the ulcerations and the partial mortifications observed in several of the tumors.

The report of Hallopeau and Jeanselme¹⁴ Mar., '92 on the autopsy in this case showed the generalization of the adenoid growths. These occupied not only the skin, in the form of tumors or infiltrations, but also the velum palati, the base of the tongue, the larynx, the ganglia of the neck, axillæ, and groin; the spleen, the liver, and the kidneys. The portal spaces were occupied by miliary nodules of adenoid structure, while similar lesions occurred in the kidneys. This report sustains the view of those observers who refer to a common morbid type the different forms of mycosis fungoides and lymphadenia. Darier remarked that the above facts were interesting as militating against the opinion of Philippson (Hamburg), who denies the lymphoid origin of mycosis, and classes it among the sarcomata.

Hallopeau and Phulpin¹⁴ Dec., '92 have collected statistics of the cases of mycosis treated during thirty-three years at the Hôpital St. Louis, the number of which has perceptibly increased of late years. From a new case they draw the following conclusions:

1. The ulcerations of the mycotic neoplasms may be consecutive to intense gangrene of their tissue. 2. They may, as stated by Gillot, Vidal, and Brocq, lay bare the skeleton. 3. They may be extended by the eccentric progress of the circumscribing fold and the accompanying destruction, by sphacelus, of their interior. 4. The zone of invasion may be fixed by an intense, dark-red areola several centimetres in diameter, the skin at its level being thickened and oedematous. 5. Diagnosis rests wholly on the co-existence of non-ulcerated mycotic neoplasms of characteristic pathognomonic appearance. 6. The characteristics of the circumscribing fold, its arrangement in a circle or in parts of circles, the perfect regularity of its contours and of its convex edge, and its spread by eccentric progress, with accompanying sphacelus of its interior, are all peculiar to these neoplasms. 7. The absence of pruritus and adenopathy helps to differentiate this mycosis from erythematous and mixed forms. 8. The obliteration of the small vessels by endothelial proliferation and thrombosis explains the severe and extensive gangrene complicating this form of the disease.

Dubreuilh,⁷⁸⁰ Mar. remarking on the many ambiguous eruptions possible in mycosis before the appearance of the true mycotic tumor, cites the case of a woman, aged 80 years, in whom this pre-mycotic stage had lasted thirty years. This whole period had been characterized by severe itching, and, latterly, with an eruption of red and more or less crusted plaques. Sulphur baths were employed to quiet the itching, until the breaking of an arm compelled the patient to give them up for a time. The itching then became intense; tumors appeared, and the body soon showed the following manifestations: 1. Large brown macules, traces of former lesions. 2. Reddish, eczema-like patches from one to six centimetres broad, crusted or scaly, and sometimes slightly infiltrated. 3. Twenty or thirty tumors in the derma, from nut to egg size, firm in consistency, almost painless, and of a reddish or brownish color, free from black, sarcomatus pigmentation. Some were raised, others flat, and all more or less deep-seated. 4. Ulcerated tumors, round or oval and fairly regular in shape, raised, moderately hard, and quite deep-seated. These last occurred on the arms, back, and breast, and one—the largest, of the size of an egg—on the abdomen. Lesions were numerous on the neck, arms, and trunk, very little of the trunk being free from

tumors or eczematous or pigmentary plaques. Itching was intense, but applications of boric-acid vaselin gave some relief, and helped to cicatrize some of the ulcerations. Diagnosis left no doubt as to the presence of mycosis fungoides. This case is important as showing how a generalized pruriginous eruption of urticarial or eczematous type, for years resisting treatment, may prove a pre-mycotic manifestation. In the absence of any known cure for the disease, Dubreuilh recommends efforts toward the temporary relief of the patient.

W. Allen Jamieson³⁶ Mar. reports the case of a woman, a native of Aberdeenshire, of 38 years, in whom the disease began, at 35 years of age, as a red spot on the left cheek, under the eye. Two years afterward "lumps" appeared, first on the shoulders, some of which were said to have become absorbed. The disease progressed until it covered different portions of the body. At the patient's death, which occurred three years after the disease was first noticed, the autopsy revealed nothing abnormal except fatty degeneration of the heart and liver. R. F. C. Leith, who made the histological examination, was strongly inclined to regard it as a sarcoma, or, rather, as a slowly-growing lymphosarcoma.

Jamieson³⁶ Apr. presented some notes of previously reported cases.

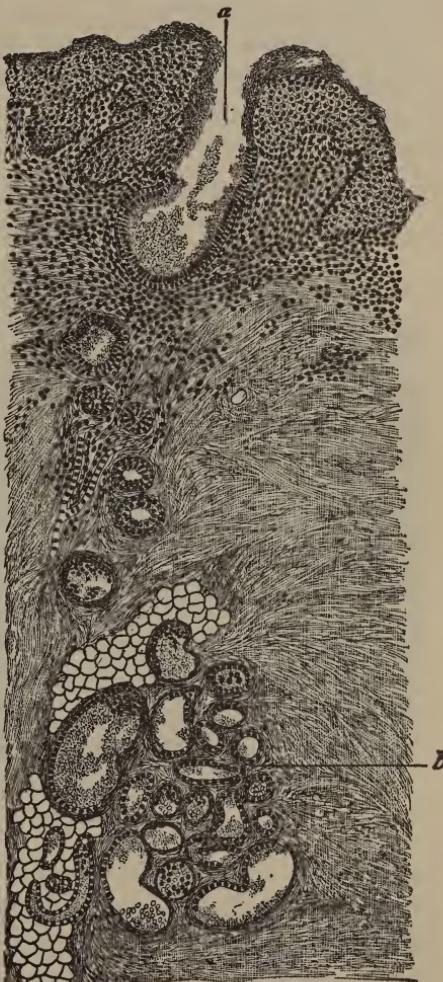


FIG. 1.—ADENOCYSTOMA CANALICULARE. (ELIOT.)
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In the discussion Norman Walker said, in regard to Philippson's idea of an eczematous stage, that French authors did not believe it to be the true disease, but only a sort of preliminary. [I consider the eczematous stage as "preliminary" in the same sense that an eczematous stage is preliminary to the development of Paget's disease of the nipple. In a very carefully observed case which I published some years ago, under the title of "Tuberculo-Ulcerative Scrofuloderma," this eczematous stage is carefully described, although in the imperfect state of our knowledge at that time the nature of the disease was misunderstood.—A. V. H.]

Nævus.—George T. Eliot²⁴⁵ describes a case of adenocystoma

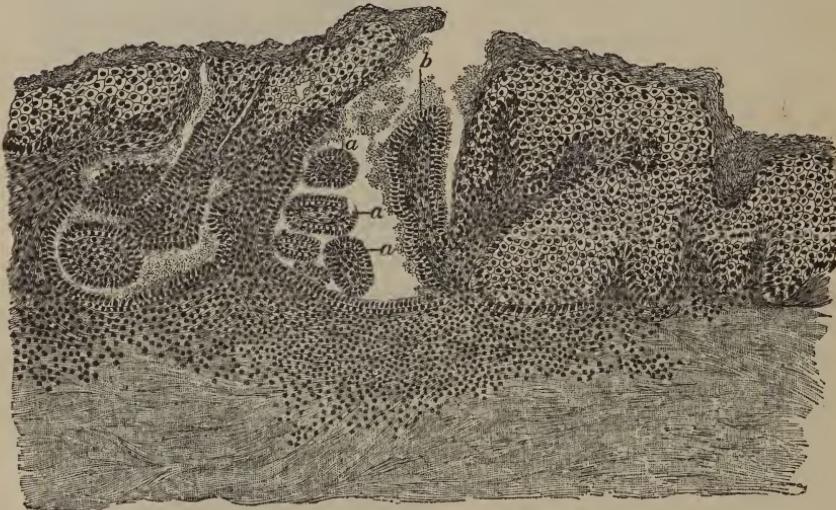


FIG. 2.—ADENOCYSTOMA CANALICULARE. (ELIOT.)
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canaliculare occurring in a nævus unius lateris. The cystic formations corresponded in site to the pathological process in the sweat-coils and ducts. In Fig. 1 there is represented a coil in various stages of cystic formation,—from an almost normal portion of a coil to the large cavity lined by vestiges of a basement membrane and a few cubical epithelia, and containing the granular remains of the cells formerly filling it up. Above the cystic aggregations dilated portions of the duct can also be seen, forming a broken chain, which leads up to the cutaneous surface; and at this point the orifice is seen to be much dilated, and in the sections, as a whole, presented changes deserving of special mention. It was

found that this portion of the duct, just below the rete, had evidently undergone extensive proliferation in every direction, cavities lined with cubical epithelium and a basement membrane being seen, extending to considerable distances away from the part of the canal passing through the rete, although still remaining in open communication with this latter, which was much dilated, and, in fact, entirely transformed in appearance. This cavity formation, in the portion of the duct in the rete and just below it, can be seen in Figs. 1 and 2. In Fig. 2 will also be observed an ingrowth (*b*)

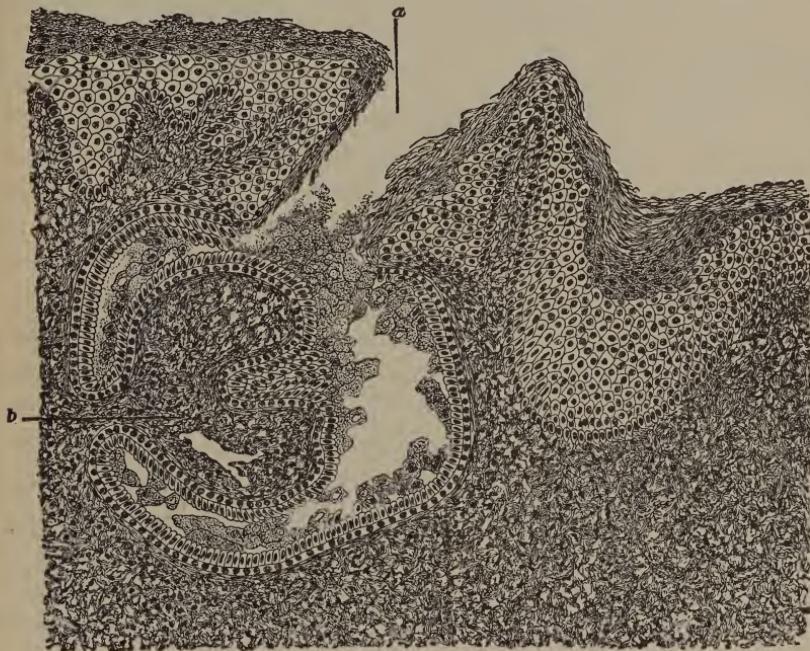


FIG. 3.—ADENOCYSTOMA CANALICULARE. (ELIOT.)
Journal of Cutaneous and Genito-Urinary Diseases.

and several bodies of varying shape (*a*, *a*, *a*), constituted of connective tissue surrounded by a basement membrane and cubical epithelium. These bodies are undoubtedly sections across the free portions of intra-canalicular ingrowths similar to *b*, and this intra-canalicular growth was beautifully shown in an osmic-acid preparation from which Fig. 3 was drawn. In this section the polypoid bud is seen jutting into and lying free in the cavity formed by the proliferation of the duct at its upper portion.

Cuthbert R. Barham ⁵⁹ Feb. 18 reports an interesting case of nævus

unius lateris, limited to the right side. The disease was first pointed out by Rayer, followed by Barenprung in the report of two cases. Kopp ascribes it to congenital malformation of blood-vessels following certain nerves. Arbuthnot Lane^{Oct. 22, '92} reports the case of a boy of 7 years, who had a tumor of the right side of the body which seemed to be under the muscular layer of the abdomen. He operated upon it, and found that it was a nævus connected with the liver and kidney.

The accompanying plate illustrates a case of extensive hairy nævus of the face seen by G. H. Fox,^{245 May} who successfully removed the growth by electrolysis. The treatment consisted in carefully passing a fine, flexible steel needle connected with the negative pole of a galvanic battery through the most superficial portion of the growth, the circuit being completed by the patient grasping a moist sponge attached to the positive electrode. This was repeated until the electrolytic destruction of tissue reduced the growth to the level of the surrounding skin, removed the pigmentation, and to a certain extent destroyed the hypertrophied hair-follicles. The slight growth of hair which persisted after the affected skin had become smooth and comparatively normal in color was destroyed by the introduction of the electrolytic needle into each separate follicle, according to the method employed in the treatment of superfluous hair upon the chin and elsewhere. The battery used consisted of 40 Law cells, with a rheostat reducing the current to a strength of from 3 to 5 milliampères. The effect of the electrolytic action around the needle was to produce a destructive inflammation, which was quickly followed by a thin, superficial crust, which dried and fell, usually in a few days.

Œdema.—C. W. Cutler^{245 May} and Charles P. Russell^{245 Mar.} report interesting cases of acute circumscribed œdema. Cutler's case occurred on the face, and Russell's at or near the axillæ. The accompanying cut illustrates a case seen by Hutchinson,^{806 Jan.} one of two who were the subjects of that form of solid œdema which not infrequently occurs as a result of repeated attacks of an erysipelatous swelling of the face. The disease may occur at any age, but is more common in adults than in young persons, and produces, as a rule, more conspicuous deformity in women than in men. The usual history is that the patient has been liable for years to recurring attacks of erysipelas, transitory in duration and limited



Nævus before and after treatment by Electrolysis (Fox).

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to the face, but attended with very considerable oedema. The final condition is one allied to elephantiasis. The disease is wholly local.

Paget's Disease.—Dubois-Havenith⁸⁶⁸ Mar. 11 describes a case of Paget's disease in a woman of 80. The affection, beginning with a simple excoriation of the nipple, spread in four years' time beyond the areola into the surrounding tissues, with total disappearance of the nipple. The middle of the breast was then occupied with a bright-red, exuding plaque, five or six centimetres in diameter, slightly ulcerated, and covered with crusts not detachable without bleeding. The surface was shiny, clearly mammillated,



SOLID OEDEMA OF THE EYELIDS. (HUTCHINSON.)
Archives of Surgery.

and finely granulated. The whole plaque was highly sensitive to touch, and was the seat of intense itching and darting pains. A distinct border-line, tracing out short but clear arcs of circles, separated it from the healthy skin without.

But for its flaky surface and distinct outline and the slow disappearance of the nipple, the lesion might have been taken for a chronic eczema. The breast was hard to the touch, and showed cancerous degeneration. The adjacent axillary ganglia were affected, and the patient complained of neuralgic pains radiating to the cervical region. Histological examination of fragments detached with the curette showed, in the epidermic cells and

their interpapillary prolongations, the psorosperms described by Wickham, Darier, and others. Fournier and Couillaud¹⁴ report a case of Paget's disease of the perineal region and the scrotum, in which microscopic analysis by Darier revealed, in the epidermis, bodies apparently psorospermic.

Panaritium.—Adolf Schmitt³⁴ advises, when the disease is not extensive, deep incisions with the aid of local anaesthesia by an ether spray, in lieu of chloroform anaesthesia. He also favors mechanical compression and thorough antisepsis. By this process pains and haemorrhage are overcome, and a free incision, extending to the diseased tissue, can be made; the danger of severing the sheath of the tendon, which occurs so frequently in hasty incisions and punctures, is also avoided. He states that free incision relieves the pains completely, and limits the affection to the area involved; while new tissue does not become necrosed, all necrosed tissue is rapidly removed and a cure is much hastened. In panaritium of the sheath, the latter must be split as far as the pus extends; this is the only means by which necrosis of the tendon may be averted and the tendon saved. When the tendon sheath is involved and covered with pus, is of a whitish or grayish-green color, and has partially or entirely lost its gloss, the tendon may be separated at the point where it appears healthy, and removed, as it is usually functionally worthless. Schmitt says that it is not always an easy matter to decide when to make an incision, and that it is dangerous to wait for the formation of pus, as the disease is apt to spread and cause extensive necroses, involving the tissue, the tendons, and phalanges. He regards redness and oedema of the finger and excessive painfulness as the surest signs of the presence of pus. He condemns poultices and moist bandages. When doubt exists as to the proper place for making an incision, Schmitt rests the finger on a piece of pasteboard and places the hand and arm in a high position on a pillow, which lessens the blood-supply and decreases the pain. He considers the wet carbolic-acid bandage as very dangerous, as it favors gangrene. After making an incision, he tampons the wound very lightly with sterilized or iodoform gauze, bandages with sterilized gauze, places the hand on a small board, and suspends it. At first the bandage must be changed daily, and the tampon gradually decreased. After six to eight days the hand is bathed for short periods in

tepid water, previously boiled. The wound granulates well, and bandaging is only necessary every two or three days. He recommends this treatment also in extensive phlegmons, washing with antiseptic solutions being unnecessary after the incision. Sterilized water or solutions of common salt answer equally well when it is desirable to wash out pus or necrosed tissue.

Pediculosis.—Joseph Grindon ³⁶⁴_{Mar. 11} records the case of a whole family affected with pediculosis, in whom all three forms were witnessed, and where the pediculus of one region migrated to the habitat of the other variety. G. G. Campbell ²⁸²_{Feb.} cites a case where ova were found upon the eyebrows and a pediculus pubis on the scalp of a child.

Pemphigus.—From a study of three cases of pemphigus foliaceus Hallopeau and H. Fournier ¹⁴_{Nov., '92} draw the following conclusions: This disease is strikingly analogous in its clinical aspects with the dermatitis herpetiformis of Duhring. In both cases there may be produced polymorphous eruptions, prolonged periods of intermission, and very painful sensations of itching or smarting. The character of exuding and exfoliative erythrodermia assumed by the eruption, its persistent generalization, the disposition of the bullar swellings in concentric and serpiginous layers, and, finally, serious trouble with the general nutrition, leading almost inevitably to a fatal result, point clearly to pemphigus foliaceus.

Regensburger, of San Francisco, ²⁴⁵_{Feb.} reports the case of a German, 50 years of age, who had always enjoyed good health until an attack of influenza, in January, 1892, which left him somewhat weakened. A few weeks afterward he noticed the appearance of several bullæ over the sternum,—hazel-nut size, tense, and containing a straw-yellow fluid. After a time these burst and left the epidermis hanging in shreds. The disease gradually extended, new bullæ forming and rupturing, while the ruptured lesions showed no tendency to heal. Several febrile outbreaks took place, each followed by a renewed eruption of the bullæ. Sometimes, however, no bullæ were present, the entire surface, excepting the palms and soles, being covered with fine, papery scales and shreds of epidermis, and having a glazed appearance. There was bowel disturbance at times. In spite of various treatment, the patient succumbed to the disease, after suffering extreme anguish for several months.

Hutchinson ⁸⁰⁶_{Oct., '92} speaks of a peculiar form of sore mouth preceding an eruption of the skin which resembled true pemphigus. Crocker drew attention to the fact that Neumann had recorded similar cases. One other case of pemphigus vegetans was seen by Kaposi. N. G. Powne ¹⁹⁹_{Mar.} states that in a case observed by him the cutaneous eruption of pemphigus was preceded by a similar condition of the mouth. Crocker and Kaposi refer to the same condition being present in cases seen by them.

Perlèche.—The disease described by Paul Raymond ²⁸⁷_{July 6} as “perlèche” occurs, according to Raymond, principally in children, and is particularly characterized by changes in the epidermis and by lesions at the commissure of the lips, resembling rhagades in appearance. The epidermis of the commissures at first turns quite white and is raised irregularly, without, however, forming a true vesicle. A whitish, pleated cuticle is formed, due to the maceration of the epidermis, which becomes tumid and more or less raised. The lesion spreads from the fold of the commissure upward and downward toward the surface and deeper tissue. A deep fissure and sometimes several superficial rhagades are formed. The adjacent parts of the lips and of the skin of the cheeks, and also of the mucous membrane, become involved. Gradually the superficial cutaneous layers disappear and the cutis becomes bare. The affection is usually bilateral, sometimes unilateral, and very seldom painful; it is strictly confined to the neighborhood of the commissures, and never attacks the middle portion of the lips; it has a tendency to heal spontaneously. Lemaistre has seen the disease get well in fifteen to thirty days, and Raymond in four to six weeks. Relapses pursuing the same typical course are of very frequent occurrence, and “perlèche” is not infrequently confounded with herpes and even with plaques muqueuses. The disorder appears to be contagious, for as soon as one child in a school has been attacked the other children usually become affected, and even children of very tender years. Not infrequently “perlèche” has been observed to attack whole families, including the parents; it is of frequent occurrence, particularly in schools having a large number of pupils; in one school forty-two out of one hundred and fifty-five scholars contracted the affection. During the winter the disease is less common than in the summer, because of the contagion being less frequent. Direct con-

tact (such as a kiss), drinking out of the same glass, and using the same towels tend to propagate the disease. Boys and girls are affected in a similar manner. In gelatin cultures from the subepidermal layer the *staphylococcus cereus albus* was always present, sometimes in connection with the *staphylococcus aureus* or with the *streptococcus plicatilis*. Raymond does not regard the *staphylococcus cereus albus* as the only specific fungus in this affection; he believes that the fungus alone may cause "perlèche," but also thinks that other microbes may give rise to it. In the discussion Fournier stated that the affection also exists in adults, and that sometimes differential diagnosis is difficult. He was called as expert to testify in a case in which the lesion on the lips was thought to be of syphilitic origin, but proved to be "perlèche."

Pityriasis Rosea—*Pityriasis Maculata et Circinata (Duhring)*.—Hutchinson ⁸⁰⁶_{Oct., '92} refers to cases of this disease. Two illustrations of cases diagnosed as "herpes tonsurans maculosus (Kaposi)" and "herpes tonsurans (Neumann)," probably among those exhibited at the Dermatological Congress, are, in his opinion, examples of pityriasis rosea which may be taken for syphilis at the first glance.

Plica Polonica.—H. W. Stelwagon ²⁸²_{Feb.} records a case of plica in an Irish woman of 40 years. The disease had lasted twelve years, and the felted lock had reached to the ankles, being four feet one inch in length. The patient was of cleanly habits, and there was no ascribable cause for the occurrence of this condition.

Prurigo.—Apropos of three cases of the prurigo of Hebra at the Hôpital St. Louis, Fournier ³¹_{Apr., '20} gives an account of the disease, otherwise called chronic prurigo, chronic polymorphous lichen, etc. It begins sometimes in the cradle, in the seventh or eighth month; usually from the second to the fifth year; less often from the tenth to the fifteenth, and very seldom later. It starts, usually in infancy, with urticarial outbreaks, changes in the second or third year to papular eruptions (strophulus), and finally takes definite form in hundreds of little papules, solid, full, and discrete; at first pinkish, then red, and finally crowned with blood drawn to the surface by scratching, and there hardened. These papules are highly pruriginous; scratching is inevitable, and brings on, besides the natural traumatic results, (1) pigmentation, perhaps very deep; (2) lichenization of the skin, which becomes thick, hard, and wrinkled, and

suggestive of pityriasis; (3) eczema-like eruptions due to chronic irritation; and (4) secondary lesions from microbic inoculation (folliculitis, boils, abscesses, etc.). The inflammation next attacks the ganglia, and buboes often appear on the groin. The lesions affect points of confluence. They are found on the limbs, especially on the extension side of the legs, often on the trunk, only in severe cases on the face, and never in the folds of the joints, nor on the scalp, palms, or soles. The disease proceeds with alternate periods, sometimes of six or eight months, of eruption and intermission. Attacks may be retarded by cleanliness, care in diet and in the use of alcoholic liquors, and avoidance of fatigue, overwork, worry, etc. Hebra regarded it as a winter disease, but recent investigation shows that the attacks are worst in summer. Hebra also pronounced it incurable. There are, however, two forms, a severe (*prurigo agria* or *ferox*) and a mild (*prurigo mitis*). The latter admits of cure, usually from the twenty-fifth to the thirtieth year. Clear cases have been shown by Besnier, Vidal, and others. The disease is not contagious. It is more frequent with men than with women, and usually attacks the feeble, ill-fed, ill-lodged, lymphatic or scrofulous children of the poorer classes. It comes not by direct heredity, but from family tendency. Some consider the affection essential, others merely symptomatic, while a third view (Vidal) classes it with the dermatoneuroses. Toxæmia and urticarial degenerescence have also been suggested. The usual internal tonic remedies are, of course, in order; but the main dependence is on external treatment with emollient baths, ointments, and modifiers of the skin.

Hutchinson⁸⁰⁶ refers to the rarity of pruriginous affections in some parts of Europe, Fiertz, of Zurich, having assured him that no prurigo of any kind was ever observed there. At Nuremberg it is very rare, and cases are seldom seen in England or the United States. Constitutional peculiarities of the skin and parasitic affections, such as pediculosis and scabies, have a decided influence upon its production.

Pruritus.—L. Bremer¹⁰⁷ defines the difference between peripheral and what he calls "brain itch." He believes that there is a pruritic condition which has its origin in the cortical substance of the brain, which differs from the ordinary peripheral condition. W. J. Nolan⁷⁶⁰ calls attention to a pruritus, observed about two

inches below the umbilicus, often encroaching upon the scrotum, in a patient of plethoric habit. The hair was removed from the parts without avail. In commenting on this condition, Waugh advised colchicine and sodium salicylate internally, and tr. benzoin. locally, with low diet, plenty of fruit, and cold water. J. E. Pryor ¹⁹ _{Oct. 8, '92} advises calomel or a saline, and the removal of all complications, viz., haemorrhoids, fissures, etc., in the treatment of pruritus ani. Locally, listerine and carbolic acid, tr. iodine; but before using the latter the intestines must be evacuated by an injection of soap and water and the parts dried. If iodine is too strong, tr. opii can be added. From four to six applications are all that are necessary.

Psoriasis.—J. Abbott Cantrell, ¹¹⁹ _{Jan. 16} in discussing the differential diagnosis between psoriasis and syphilis, speaks of the successive crops of lesions and their possible coalescence in psoriasis, in contradistinction to the appearance of the cutaneous eruptions of syphilis, and describes several cases of each where the disease was manifested upon the body or upon the head.

Purpura.—Legroux ³¹ _{Dec. '92} thinks that purpura simplex is much less simple as to its pathogeny than the name indicates. It may be due to: (a) Vascular alteration, as in cachectic diseases, tuberculosis, or cancer. (b) Alteration in the blood, infections, whether well or ill defined, bringing on purpuric extravasations, and, by the microbes and leucocytes emanating from them, capillary thrombosis, and finally rupture. (c) The state of the nervous system, as in tabes, where, after crises of acute pain, the skin has become suffused with blood. Purpura from fright is inadmissible. This form of the disease is distinguished by the symmetry of the spots and by its recurrence. (d) Possibly, auto-intoxication occasioned by non-excreted products or ptomaines. This theory is tenable, phosphorous poisoning, for instance, having been known to cause purpura.

Legroux treats purpura according to its possible cause and the state of the sick child. Cinchona may be given, but the iron compounds act better, especially the perchloride of iron in doses of from 2 to 4 grammes (31 to 62 grains) daily. If the child is somewhat anaemic, the inhalation of oxygen will promote haematosi. Injections of ergotin may serve to check slight cutaneous haemorrhages, but they should be used with caution, since the tension of the blood resulting from their use may cause rupture of the

diseased vessels. Furthermore, puncture with the syringe may induce quite considerable suffusions of blood in the spots punctured. Stimulating liquors are also of use, but the best remedy in case of extreme anæmia is the transfusion into the veins, with the utmost antiseptic precaution, of an artificial serum, which acts lightly on the tension of the blood and stimulates the nervous system.

Grüning²¹ Apr. differentiates two main groups of purpura or morbus maculosus: (1) a variety secondary to other diseases or to an existing hæmorrhagic diathesis, and (2) morbus maculosus in a narrow sense, under which are included in general all these hæmorrhagic diseases, which clinically originate idiopathically and show a well-defined course. The existence of a specific virus *sui generis*, if Letzerich's researches are excluded, has not, as yet, been proven. Grüning quotes three cases, respectively 3, 4, and 16 years of age; two of these cases, brother and sister, lived in one room; the other belonged to a different family and lived in another room, which communicated with the same landing, and had but one range in common. The brother and sister were taken sick on the same day, and on the following day the daughter of the neighboring family became ill. One of the children, aged 3, suffered more severely from the disease, which was accompanied by irregular fever, and lasted six weeks. The purpuric spots were confined to the external skin, and the visible mucous membranes were left intact. Internal hæmorrhages did not occur, or at least could not be demonstrated clinically. The cutaneous ecchymoses appeared in successive stages, which were ushered in with great regularity by febrile exacerbations. The little patient also suffered simultaneously from a severe bronchitis, followed by lobular infiltration of the lungs. Severe emesis and a remarkable sensitiveness to pressure in the abdomen were present from the beginning; these symptoms ceased with the disappearance of the fever. The diagnosis was difficult at first, particularly as the house had been visited by an intense epidemic of typhus. The further course, and particularly the continued re-appearance *de novo* of the characteristic petechiæ and cutaneous ecchymoses, however, removed all doubt. The diagnosis presented more difficulty still in the patient aged 16, the sister of the younger one; there was high fever, which declined critically on the fourteenth day, and was accompanied by numerous hæmorrhagic eruptions; the fact of the brother being

taken sick simultaneously, however, assisted Grüning in the correct diagnosis. The haemorrhagic eruptions did not resemble those of petechial typhus. In this case the disease was limited to one invasion, and did not re-appear in successive stages, as in the brother's case. The abdomen was also very sensitive to pressure, and a light catarrhal pneumonitis followed the bronchitis. The third patient had high fever, accompanied by delirious attacks for a period of eleven days before the cutaneous haemorrhages appeared. On the tenth day her skin was entirely free from eruptions; the next day it was covered with very numerous petechiae and ecchymoses, accompanied simultaneously by severe febrile exacerbation. In this case the parallelism between the febrile exacerbations and the appearance of new cutaneous haemorrhages was also quite characteristic. The question arises, Did the infection originate from a common source, or was the contagion transmitted from man to man? Grüning regards these cases as worthy of particular notice, as all three cases were taken sick simultaneously, the infectious origin of febrile *morbus maculosus* having scarcely been mentioned in the literature of the subject, and, consequently, probably observed but rarely. Foerster quotes a case in which three children in one family were attacked almost simultaneously by purpura simplex.

M. Schönfeldt²¹ reports a case of purpura haemorrhagica (*vaniolosa*?) in a demented patient, aged 39, who had previously been well, enjoyed normal appetite, and slept well. After a sleepless night he complained of "feeling sore all over," his face was slightly red, and he complained of headache, anorexia, and of apparently severe pains in the abdomen. No fever, pulse normal, respiration good. A few days later, after being unable to sleep on account of "severe pains in the abdomen," the patient's legs were found to be drawn toward the chin and could not be flexed until an hypodermatic injection of morphine had been given. Both conjunctivæ bulbi showed haemorrhages, the face was slightly red and somewhat œdematosus, the tongue heavily coated, and the breath fetid. In the lower abdominal and inguinal region and on the inner surface of both thighs there appeared very numerous, bluish-red petechiae, ranging in size from a pinhead to a hemp-seed and pea, which were not raised above the level of the skin, and gave the entire area the appearance of being sprinkled. The face, breast,

and back were free from lesions; the extensor surfaces of both arms showed flat, diffused, continuous extravasations of blood of a reddish-blue color; on the internal surface of the arms and legs only isolated haemorrhages were noticeable, the size of a lentil to that of a pea. No fever, pulse not markedly affected; no bleeding from the nose, mouth, etc. The case was diagnosed as *morbus maculosus Werlhofii*. Numerous petechiae also appeared in the region of the sacrum and on the legs, becoming confluent in places and assuming the size of hazel-nuts; isolated extravasations of blood of varying size were also present on the breast and back, being more numerous in the sacral and gluteal regions; the face remained free. There existed marked dysphagia, the sensorium remained unimpaired, and the temperature was normal (37.2° C.— 98.6° F.); pulse 90, soft; respiration somewhat accelerated. The urine contained albumen. The patient died on the fourth day. At the autopsy isolated extravasations of blood into the intercostal muscles and subcutaneous connective tissue, and haemorrhages in the tonsils, were found. There was an extravasation of blood, the size of a walnut, into the cellular tissue of the hilus of the right kidney and numerous ecchymoses in the stomach. Isolated extravasations of blood into the mesentery existed, but none in the intestinal wall proper or in the parenchyma of the other organs of the abdominal cavity, or the brain, which showed no remarkable alterations. The diagnosis of *morbus maculosus Werlhofii* was abandoned, and the case regarded as one of varioloid purpura. The post-mortem failing to sufficiently reveal the cause of the early death Schönfeldt considers this circumstance as very much in favor of a diagnosis of variola, regarding the absence of fever and lack of pain in the sacral region as of secondary moment. The mental condition of the patient also rendered a correct temperature record very difficult, and Schönfeldt is of the opinion that *variola purpurosa* may also at times pursue an afebrile course. Schmidt remarked that he had never observed a case of *purpura variolosa*, but concludes, from the perusal of the literature on the subject, that fever is usually absent during its course. Krannhals discusses the reported cases of probable general infection with the bacillus pyocyaneus, known as "maladie pyocyanique" in man, numbering 5 in all,—2 by Ehlers, 1 by Neumann, 1 by Oettinger, and 1 by Karlinski. These cases were all characterized by marked peculiarities. The main symptoms

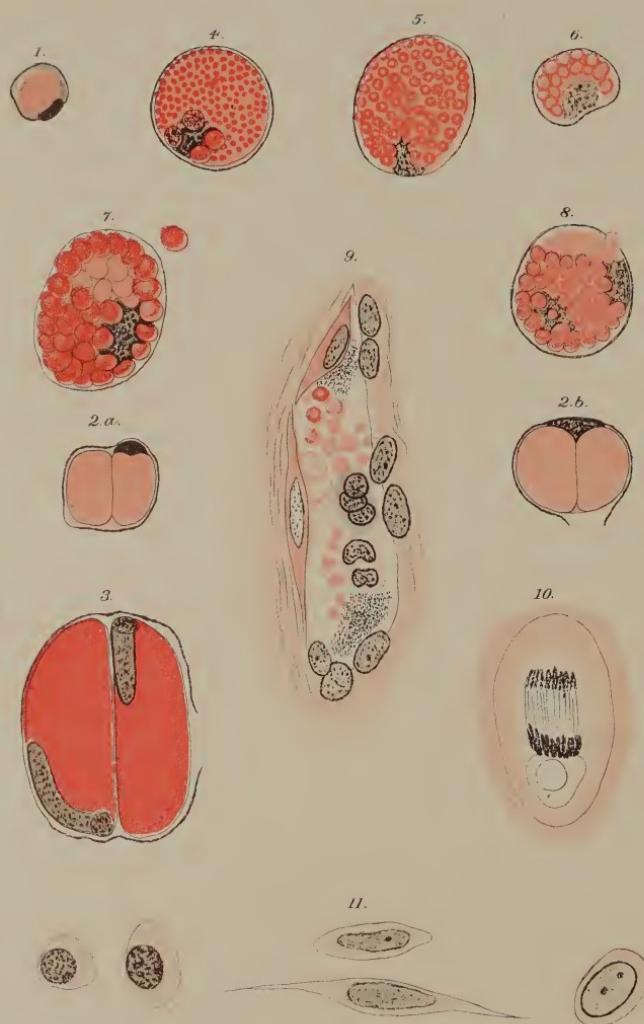
are described as consisting of a febrile affection, ushered in by grave nervous symptoms; commencement acute, marked prostration, stupor, marked elevation of temperature, early appearance of diarrhoea, and, finally, most characteristic, though not present in all cases, a cutaneous affection resembling ecthyma and consisting of pustules, which soon become vesicles; these rupture, and a necrosed cutaneous ulcer with haemorrhagic infiltrated margins remains. In favorable cases these ulcers soon heal; they may reappear in repeated succession. In the fatal cases acute enteritis and a tumor of the spleen existed. The bacillus pyocyanus was found in the contents of the ecthyma pustules, in the blood, in the juice of the spleen, etc. *Maladie pyocyanique* in man belongs to the large domain of septic diseases, and may seemingly originate spontaneously, as so-called cryptogenetic septicæmia, from an unknown port of invasion, and may also follow infection of an external wound with the bacillus pyocyanus. He gives the results of an autopsy in the case of a man, aged 20 years, in whom the operation of resection of a rib had been performed for pleuritic empyema. Twenty-eight days later febrile symptoms re-appeared, accompanied by diarrhoea, impaired sensorium, and marked asthenia; the case ended fatally after eleven days. At the autopsy the following conditions were found: Brownish-green, sticky coating in the right cavity of the pleura; purulent mediastinitis; pericarditis; marked enteritis, partly haemorrhagic, accompanied by tumefaction of the plaques and follicles, and an acute tumor of the spleen. By means of the plate method the bacillus pyocyanus (more correctly pyofluorescens) was found in absolute purity in the pus of the mediastinum and exudation of the pericardium and in the substance of the spleen.

In a case of croupous pneumonia complicated with purpura haemorrhagica, Jaworski⁹⁹ says that the eruption was from the umbilicus downward. The lesions were pinhead- to lentil- sized. The patient also had a haemorrhage beneath the conjunctiva into the sclera, and upon the surface of the tongue and lower lip. The urine contained red corpuscles. Malcolm Morris¹⁰⁷⁷ May 10 gives the history of the case of a nurse-girl who had a haemorrhage from gums and nose, papular purpuric lesions on both legs, and large, flat ecchymoses upon the arms. He advised a mixture of liquid extract of ergot, to be taken in an iron mixture.

Roque²¹¹ describes two cases of infectious purpura in little girls of 10 and 8, of healthy parents, the dwelling being sanitary, and without apparent change of regimen. Both suffered from lassitude, sleeplessness, loss of appetite, and slight fever. In the elder the disease began with diarrhoea, without colic or tenesmus, the stools being of a turbid, watery nature, becoming bloody on the seventh day. No morbid localization could be detected. The temperature was 38.4° C. (101.2° F.). On the ninth day the diarrhoea stopped, and on the tenth a pinhead eruption, clearly purpuric, broke out on the lower limbs. On the twelfth a furuncular eruption appeared at the root of the thigh, drying up at the end of a week, with no return of either diarrhoea or purpura. The temperature was 37.5° C. (99.5° F.). On the thirty-fourth day the child was well.

The second case, beginning in the same way, showed, on the seventh day, a confluent purpuric eruption, in large ecchymotic spots, on the lower limbs, abdomen, and buttocks. On the ninth day the purpura faded out, only to recur five times within the next eight days, on exposure to moisture or cold. On the seventeenth day the temperature reached 39° C. (102.2° F.), and a confluent outbreak of rounded, erythematous plaques appeared on both upper and lower limbs. On the twenty-first day everything had disappeared, and the patient left her bed. Three more purpuric outbreaks came on soon afterward, but without change of temperature. The occurrence of two cases in one family, Roque thinks, points to a common cause, and suggests infection. For analogy he cites petechial fever, Werlhof's disease, etc. Regarding purpura not as a disease, but as a symptom of disease, and remembering that in both cases examination showed the blood-vessels and arteries unaltered, he concludes that purpura here was only a phase of the irritative action of an infectious germ, microbe, or toxin on the vasomotors. By such agency the vasomotors may be either paralyzed or excited, and the effect manifested in redness, exaggerated secretions, or haemorrhages, the disease remaining the same whether purpura appears or not.

Sarcoma.—Hallopeau and Jeanselme^{14, Nov., 1902} describe a case of cutaneous sarcomatosis showing the clinical features of an infectious lymphangitis, in which autopsy sustained previous diagnosis. Sarcomatous tumors existed not only in the left arm, but



Protozoid formations in tumors of the Skin (Toûton).

Münchener Medicinische Wochenschrift.

also in the ganglia of the corresponding armpit, in the cellular tissue of the costal wall below the parietal pleura, and in the lung below the serous and at the level of the diaphragmatic pleura. Four similar tumors were found on the surface of one kidney. Several lung-tumors were hollowed out in little cavities filled with blood, the cavity sometimes connecting with the extreme bronchial ramifications, so as to explain the repeated spitting of blood by the patient. The neoplastic tissue consisted of fusiform or polygonal cells, while the vessels were very friable, and often obliterated by the sarcomatous shoots. Touton³⁴ _{Jan. 10} reports a case of supposed generalized sarcomata of the skin, due to leukæmia or pseudo-leukæmia, cured by arsenic. He gives a description of the proto-zoid formations in skin-tumors, illustrated by a colored plate, here reproduced. I. E. Cohn²⁴⁵ _{Oct., '92} records a case of multiple sarcoma of the head of a female. The same condition is commencing upon the head of an only surviving child, a son of 25 years.

Scleroderma.—Goldzieher²¹³⁴ _{Mar. 12} presented three cases of patients affected with scleroderma in Lassar's clinic, and showed, by means of wax models, the changes in a case which had been treated. If scleroderma in plaques is excluded, the disease is seen to be characterized by a progressive chronic dermatitis accompanied by permanent œdema. The skin resembled in appearance that of individuals suffering from cholera or from arsenical poisoning. Kaposi compares it to that of frozen cadavers. Heller, in 1872, basing his views on a post-mortem examination, connected the disease with occlusion of the thoracic duct. In one of Goldzieher's cases, that of a young man, the genesis of the disease is clear. This patient had both of his hands frozen the preceding year; the frozen extremities presented somewhat a picture of a burn of the second degree with numerous vesicles. A marked cicatrical condition of the skin ensued, and was followed finally by complete sclerodactylyia. The disturbances of the functions are quite marked. In the second patient, a woman, about 50, who had become completely paralyzed by the affection, the etiology of the existing scleroderma of the lower extremities was very similar. The treatment of these two cases was followed by decided improvement, and consisted of salt-water baths and massage with 2-per-cent. salicylic vaselin. The same treatment will be tried in the third female patient, who attributes her disease—sclerodactylyia—to her occupation, which

compelled her to frequently wash vessels in cold water. Goldzieher is of opinion that the applications of salicylic acid macerate the skin and allow the fat to enter more readily. One of the patients complained of anaesthesia and paraesthesia; in one hand he experienced permanently a sense of cold, and in the other a sense of warmth. G. Lewin called attention to the benefit derived from the use of electricity and unguentum cinereum in scleroderma.

Stephen Mackenzie¹⁰⁷⁷ Mar. records two cases of the diffuse form of scleroderma,—one in a boy of 14 years, and the other in a girl of 9 years. In both cases the condition covered most of the body-surface; the hands were drawn up and almost immovable. In the boy the face was so much affected that he could scarcely open his mouth. He was also suffering from Raynaud's disease of both hands.

Syphiloderma.—G. Frank Lydston¹¹⁵ Oct., '92 records the case of a woman in whom the lesions of syphilis were circinate, papulo-erythematous, and resembling the tinea circinata, being perfectly clear in the centre. [Such cases are not very uncommon, and should be carefully reported.—A. V. H.]

Tuberculosis.—According to Köbner,⁴¹ Mar. '23 true typical cutaneous tuberculosis, originating independently in the skin and not secondary to tuberculous foci in the underlying tissue, is, in comparison with the various forms of lupus,—the bacillary disease of the skin,—of exceedingly rare occurrence. Usually the disease is met with about the natural orifices of the body, as the lips, the anus, the ear, and the female genitalia, and very frequently spreads to the neighboring mucous membranes. Köbner's case, however, differs in these respects, and he considers it as of particular importance, containing a warning in regard to the mercurial treatment of doubtful ulcerations and neoplasms, and also of general interest as illustrating the hygiene of barber-shops. The patient had an ulcer of one year's duration on the lower region of the chin. The man was very anaemic, very emaciated, and suffering from complete aphonia; he stated that his wife had died of phthisis ten years ago. He was free from hereditary tuberculosis. Seven years ago he had a supposed ulcer removed in a throat clinic; he remained well after the operation until two years ago, when a small lesion made its appearance on his chin. The larynx became affected much later. During ten weeks he took ten bottles of potassium

iodide and was treated with mercurial inunctions amounting to 99 grammes ($3\frac{1}{4}$ ounces). He was in the habit of shaving every eighth day, but had discontinued on account of the pain experienced in the erosion. After the beard had been removed, a flatish, round ulcer was discovered, with small, reddish-yellow, flaccid granulations distributed over the surface. The floor of the ulcer was grayish, the edges partly livid, serrated, bleeding easily when touched, and quite painful. The neighboring lymphatics and the jugular and cervical glands were swollen, hard, and indolent. The mucous membranes and skin were anaemic. Examination of the throat revealed perichondritis epiglottidea arytaenoidea and an extensive ulceration of the true vocal cords. The diagnosis of tuberculosis of the inferior mental region was made. Köbner applied cocaine and excised a small piece of the skin; the preparations, after being hardened and stained, showed the presence of numerous bacilli, distributed throughout the entire cutis, and of giant-cells and miliary tubercles. The wound was closed by cauterization and dusted with iodoform. The floor of the ulcer became clean under this treatment and the pain decreased. Of pathognomonic interest to the clinician and connected with the genesis of the tubercle are the very small, serrated, and incised margins; these become confluent and convey the impression of cheesy spots at the margin of the ulcer, and lead to serpiginous ulcers. The patient is thrust into the syphilitic department of the hospital, and his condition is aggravated by mercurial treatment. During the last four weeks the tuberculosis of the larynx had spread to the anterior folds of the palate. Köbner states that the patient, although having a tuberculous ulcer, still continued to be shaved in public barber-shops, and thinks it quite possible that the razor may thus become a new source of tuberculous infection. This case again demonstrates the wisdom of Köbner's advice⁴ that every customer should be shaved with a razor previously plunged in boiling water and scalded, and should be provided with a separate napkin, and, if possible, should have his own shaving-material. Köbner, in the pre-bacillary era, repeatedly diagnosed cases of tuberculosis of the larynx, which were regarded by laryngologists as syphilitic and treated, accordingly, with mercurial inunctions, and were followed by such a remarkably rapid spread of the tuberculous condition that he considers any and all mercurial treatment

as contra-indicated when once the diagnosis of tuberculosis has been positively made.

Hutchinson⁸⁰⁶ refers to a case of Billroth's (*tuberculose der mamma*) in which the two breasts were covered with ulcers, and states that the symmetry proves its constitutional origin. Lang gives a case of tuberculous ulcer of the glans penis, in which the ulcer was very large. The microscope decided the diagnosis.

Hallopeau¹⁷ says that the skin may be invaded primarily or secondarily by tuberculosis. It is often invaded secondarily from suppurative tuberculosis of the ganglia or bone, or from subcutaneous tuberculous gummata and lymphangitis of the same nature. Sometimes the secondary tuberculosis of the skin becomes the point of departure of lupus. Among the primitive tuberculoses of the skin are the different forms of lupus vulgaris, anatomical tubercle or tuberculosis verrucosus, lichen scrofulosorum, and probably lupus erythematosus. Hallopeau thinks that all cases of anatomical tubercle are not tuberculous in character, but this question has not been settled.

Dale James² showed a patient who was suffering from tuberculosis of the skin, a nodule excised from the knee showing the tubercle bacillus.

Vitiligo.—Bieniecki²⁸³ presented the case of a soldier, aged 22 years, with marked absence of pigment of the skin, which he considers of great etiological importance, as the causation of cutaneous achromatosis is still very obscure. The patient belonged to a perfectly healthy family of peasants, and had never acquired syphilis. One year ago he fractured his right arm in a wagon-wheel; a few weeks later he noticed that his skin lost its color in several places. After a few months the achromatosis had spread over a large area, involving particularly the hypogastrium and the lower part of the lumbar region. The hairy scalp also showed absence of pigment in spots. Bieniecki fails to state whether the cutaneous changes were identical with those described by Riehl and Ehrmann as occurring in vitiligo, being unable to make an histological examination of the skin, the patient leaving the hospital at an early date. He regards the fracture of the arm as the etiological factor of the discoloration of the skin in this case, and attributes the achromatosis to traumatic injury of the nerves; he shares the same opinion as Beigl, Schwimmer and Leloir, and Lebrun in particular, who regard vitiligo alba

cutis as a trophoneurosis. Feulard¹⁴ Jan. 15 reports the cure of a young girl attacked with vitiligo of the body and pelade of the scalp, in which the treatment consisted of two applications of acetic acid, together with stimulating lotions (tincture of rosemary, Van Swieten's solution, and tincture of cantharides).

MISCELLANEOUS.

Pruriginous Dermatoses and the Former Lichens.—Under the title of pruriginous dermatoses of nervous origin, Brocq²⁸⁷ p. 1100, '92 groups together a number of diseases of widely differing symptoms, such as the urticarias of internal origin, the so-called lichenoid eczemas, the prurigo of Hebra, the circumscribed lichen, lichen agrius, etc., of the old French writers, the dermatitis herpetiformis of Duhring, perhaps the true lichen ruber, and others,—all of which, however, have certain features in common. Brocq insists on the need of considering not only their eruptive manifestations, but also the *ensemble* of each disease, its pathogeny, evolution, and subjective symptoms.

The eruptive manifestations may be divided into two classes: first, special eruptions seemingly peculiar to one disease, as the papules of lichen ruber or those at the beginning of the prurigo of Hebra; and, secondly, common eruptions attending widely-varying diseases, and representing only the reaction of individual organisms according to idiosyncrasy. Of this latter class the most frequent forms are the lichenoid, the eczematous, and the urticarial eruptions. A typical instance is that of lichenification. By this term Brocq designates lichenoid reaction of the skin under continued traumatism. This reaction is especially frequent in pruriginous diseases, from the scratching of parts affected. Chronic inflammation sets in; the derma becomes infiltrated with embryonic elements, and grows thick, hard, and wrinkled; the papillæ become hypertrophied, and sometimes simulate irregular and unequally-sized papules, having no relation with either the sebaceous-pilar or sudoriparous system. After a time the skin shows an exaggeration of its natural folds. The integuments have undergone infiltration, with loss of flexibility and normal consistency. This process may be pronounced, moderate, or slight. Sometimes the skin shows no marked thickening, and yet close inspection reveals between its deepened folds little, flat, shining

facets, as it were, suggestive of the beginning of lichen ruber. In such cases the skin has often assumed a brownish coloration. This particular condition may be known as *abortive lichenification*.

When produced upon a skin objectively healthy, these effects are known as *primitive lichenifications*, circumscribed or diffuse. They are the only true lichens in the old sense of the word. When occurring on spots modified by former lesions, they are *secondary lichenifications*, and represent lichenified dermatoses rather than true lichens. Secondary lichenifications are very common in chronic eczemas, artificial eruptions, pruriginous psoriasis, lichen ruber planus, mycosis fungoides, pityriasis rubra, and, above all, in the prurigo of Hebra. Lichenification is, in short, a syndrome, not solely characterizing a definite pathological group, nor furnishing any single basis of classification.

In studying, then, any disease in which it occurs, antecedent conditions should first be investigated. If no former lesion or eruption can be proved, the lichenification will appear primitive, a pure neurodermitis. Otherwise, the lichenification may be secondary, admitting the possibility of the prurigo of Hebra, lichen ruber, psoriasis, etc. Similarly, eczematous eruptions show eczematization (Besnier), another mode of individual reaction, whether under local irritation, intoxication of the system, or some nervous influence. Urticular eruptions may be regarded in like manner. Beside the foregoing forms may be noted the elementary lesions of what Vidal has called *lichen simplex aigu*,—small papules, or sometimes rose-colored papulo-vesicles, isolated, numerous, pruriginous, and often excoriated at the top. These come midway between urticaria, sudoral eruption, papular erythema, and what is known as papulo-vesicular eczema.

In the study and classification of diseases in which the above eruptive reactions occur, certain general rules should be observed : 1. Determine, when possible, the essential character of the disease, and the precise nervous condition involved. 2. Note the manner in which this nervous factor acts on the skin, whether intermittently (regularly or irregularly) or constantly ; note also the area, circumscribed or otherwise, symmetrical or not ; also, the seat of the lesions. 3. Observe the way in which the integuments react. Keeping these principles in mind, Brocq classifies the neurodermatoses as follows: (a) Neurodermia (Brocq); cases in which pruritus and

scratching are not followed by eruptive reactions. These may be generalized and chronic (senile pruritus); generalized and intermittent (arthritic or menstrual pruritus); localized and chronic; or localized and intermittent (regularly or irregularly). (b) Neurodermia (Brocq); cases of primitive lichenifications. These may be slight and usually diffuse (abortive lichenifications), or clear and marked (chronic circumscribed). (c) Eczematous lichenified neurodermia; cases in which both lichenification and eczematization occur. These may be simple lichenified eczemas, or forms after the type of the prurigo of Hebra (diathetic prurigo, Besnier), or forms intermediate between the two preceding. (d) Chronic neurodermia; cases corresponding either to the true prurigo of Hebra (chronic polymorphous), or to pure prurigo (chronic type of pure prurigo). (e) Cutaneous urticarial neuroses; cases after the type of Vidal's *lichen simplex aigu*. (f) Pure cutaneous urticarial neuroses. (g) Cutaneous neuroses of the type of herpetiform dermatitis. (h) Lichen ruber (?).

Specific Gravity of the Blood in Certain Dermatoses.—Schlesinger¹⁹ Sept. 14 gives the following result of the examination of the blood in some diseases of the skin: In eleven cases of pemphigus foliaceus, three of pemphigus pruriginosus, and five of pemphigus vulgaris, the specific gravity was above the normal both during and after an eruption. In fifteen cases of burns where death supervened, the blood was thickened for twenty-four hours and the specific gravity was increased (1.065 to 1.073). The writer thought this due to the loss of serum. In generalized cases of eczema there was a slight increase of specific gravity. In other affections, such as lichen ruber, leprosy, psoriasis, erythema multiforme, etc., no change in the density was observed. Lupus showed a normal specific gravity of the blood. Schlesinger also found, from his examinations of over 130 cases of pemphigus dermatitis calorica, urticaria, erythema multiforme, erysipelas, and herpes zoster, that the contents of the bullæ in some were below the blood-serum in respect to the proportion of albumen.

Resorption of Vaselin.—W. von Sobieranski²⁹⁷ July 19 demonstrates the cutaneous permeability of fatty substances by means of experiments on animals. Pure vaselin—not substances dissolved in water or alcohol, as is the usual routine practice—was rubbed daily into the shaved skin of the abdomen of dogs and rabbits, and

the animals were prevented from licking and thus conveying the vaselin into the intestinal tract. They were killed after about 50 grammes ($1\frac{1}{2}$ ounces) had been rubbed in, and the organs examined. The presence of vaselin could be demonstrated in the liver and kidneys, and the muscles contained the substance in measurable quantity.

THERAPEUTICS.

Seborrhœa of the Scalp.—An article on seborrhœa of the scalp by Brocq²⁹⁰ Feb. 28 suggests the following modes of treatment:—

1. Wash for simple seborrhœa (in men), with excessive oiliness of the scalp:—

- R Bicarbonate of sodium, 20 grammes (5 drachms).
Water, 1 litre (1 quart).

If desired, use less water, or add 5 grammes ($1\frac{1}{4}$ drachms) of borate of sodium.

2. Another valuable wash is:—

- R Tannin, 1 to 2 grammes ($15\frac{1}{2}$ to 31 grains).
Alum, 2 to 4 grammes ($\frac{1}{2}$ to 1 drachm).
Water, 200 grammes ($6\frac{1}{2}$ fluidounces).

3. Desiccative powder, for more active use:—

- R Salicylic acid, 1 to 2 grammes ($15\frac{1}{2}$ to 31 grains).
Naphthol, 2 to 4 grammes ($\frac{1}{2}$ to 1 drachm).
Borate of sodium, 2 to 6 grammes ($\frac{1}{2}$ to $1\frac{1}{2}$ drachms).
Carbonate of magnesium, ad lib.
Sulphur, 5 to 15 grammes ($1\frac{1}{4}$ to $3\frac{3}{4}$ drachms).
Excipient: Starch, talc,
lycopodium, &c. q. s. to make 100 grammes ($3\frac{1}{4}$ ounces).

The proportions depend on individual need. It should be prescribed in small quantities (50 grammes— $1\frac{1}{2}$ ounces), to avoid decomposition. Apply at night, and wash off in the morning with tar or Panama soap.

4. Sulphur lotion, especially for women:—

- R Precipitated sulphur, 25 grammes ($6\frac{1}{2}$ drachms).
Camphorated alcohol, 50 grammes ($1\frac{1}{2}$ fluidounces).
Glycerin, 8 grammes (2 fluidrachms).
Water, 250 grammes (8 fluidounces).

Apply at night, parting the hair in different places so as to bathe the whole scalp. After several days, when the coating seems too thick, wash off very carefully with a decoction of Panama wood and soapwort. Dry with warm towels, and pass over the scalp a little ether of petroleum. Repeat the whole process until the

sulphur ceases to adhere to the skin, a sign of approaching cure. Then replace the sulphur lotions by $\frac{1}{3}$ sublimate solution.

5. Brocq also advises the following treatment, every second day: Once, friction with ether of petroleum. Once, lotion of saponin coal-tar. Once, solution of sulphurated potassa, from 20 to 60 drops to a quarter of a glass of warm water. The liquid must be strong enough, but should not make the skin smart.

6. If there is no itching and the hair continues to fall out, friction with the following may be tried:—

R Crystall. carbolic acid,	2 to 4 grammes ($\frac{1}{2}$ to 1 drachm).
Tincture of cantharides,	10 grammes ($2\frac{1}{2}$ fluidrachms).
Tincture of rosemary,	
Tincture of pyrethrum,	
Tincture of jaborandi,	$\ddot{\text{a}}\ddot{\text{a}}$ 25 grammes ($6\frac{1}{2}$ fluidrachms).
Rum,	200 grammes ($6\frac{1}{2}$ fluidounces).

If the hair become too dry, then use the following mixture:—

R Tincture of quinine,	
Rum,	$\ddot{\text{a}}\ddot{\text{a}}$ 10 grammes ($2\frac{1}{2}$ fluidrachms).
Castor-oil,	15 grammes ($3\frac{3}{4}$ fluidrachms).

Seborrhœa Corporis.—Malcolm Morris¹⁰⁷⁷ _{May 10} discusses seborrhœa corporis, or eczema seborrhoicum, treated with benefit by resorcin or menthol, gr. x (0.65 gramme) of each to $\frac{3}{4}$ (31 grammes).

Ulcers.—Guido Bell⁵⁶ _{May} alludes to the bacterial origin of ulcers, and strongly advises antiseptics followed by the local use of pepsin or papayotin. He used these measures in three cases of ordinary ulcers and in two cases of perforating ulcer of the foot, with good results.

Bed-Sores.—Dale James² _{Nov. 12, '92} recommends Pick's zinc gelatin for threatened bed-sores. He prefers the harder preparation, because it can be removed every twenty-four hours and replaced.

Pruritic Conditions of the Skin.—Colombini⁸⁰ _{Sept. 15} advises menthol in pruritic conditions of the skin, in the following mixtures:—

R Menthol,	5 to 10 grammes ($1\frac{1}{4}$ to $2\frac{1}{2}$ drachms).
Alcohol,	100 grammes ($3\frac{1}{4}$ ounces.)
R Menthol,	10 grammes ($2\frac{1}{2}$ drachms).
Oil of sweet almonds,	10 grammes ($2\frac{1}{2}$ fluidrachms).
R Oxide of zinc,	25 grammes ($6\frac{1}{2}$ drachms).
Starch-powder,	25 grammes ($6\frac{1}{2}$ drachms).
Vaseline,	50 grammes ($1\frac{1}{2}$ ounces).
Menthol,	5 to 8 grammes ($1\frac{1}{4}$ to 2 drachms).

R	Oxide of zinc,	10 grammes ($2\frac{1}{2}$ drachms).
	Bismuth subnit.,	10 grammes ($2\frac{1}{2}$ drachms).
	Menthol,	1 to 3 grammes ($15\frac{1}{2}$ to 46 grains).
	Starch-powder,	1 to 30 grammes ($15\frac{1}{2}$ grains to 1 ounce).

If applied to mucous surfaces the menthol should be weakened.

OPHTHALMOLOGY.

By CHARLES A. OLIVER, A.M., M.D.,

ASSISTED BY

WILLIAM CAMPBELL POSEY, A.B., M.D.,

PHILADELPHIA.

SECTION I.

CONGENITAL ANOMALIES, EMBRYOLOGY, AND HISTOLOGICAL ANATOMY.

Mitvalsky, of Prague,²⁵⁴ has had the opportunity of studying, clinically and histologically, a *congenital cyst of the lower lid*. He found that the globe, which was markedly microphthalmic, consisted of a typical scleral envelope, which covered the optic nerve posteriorly and inserted itself anteriorly into a well-formed cornea, the seat of a parenchymatous inflammation. The scleral envelope was open below, and its tissue formed a large sac at the anterior portion of the globe, which, although in close relationship with the cyst of the lower lid, was separated from it by orbital fat. On the border between the scleral and the fibrous tissue, there were small islands of cartilage upon both sides. The posterior surface of the cornea was covered by the pars retinalis iridis alone, while this layer, which covered the ciliary processes and the depressions in the ectasic portions as a cylindrical epithelium, continued as a layer of gliomatous cells. The rudiment of the lens was found partially imbedded in the sclera. The outer layer of the cyst seemed to be formed by the ectasic sclera. An intercalary tissue, consisting of numerous depressions and splits, and arising from the distant layer of the primary optic vessel, was seen to be directly continuous with the darkly-pigmented epithelium of one layer. A direct communication could be traced from the depressions of this membrane to the ocular spaces. The lining membrane of the cyst could not be determined to be a retinal layer, although it showed traces of a diffuse interstitial retinitis. In regard to the genesis of this affection, the author states that the development of the eye stopped

with the formation of the primary optic vesicle. The proximal layer continued growing, however, and produced the typical pigment layer of the retina of the ciliary body, and of the anterior layer of the pars retinalis iridis. The choroid, the ciliary body, and the sclera had developed around this, which, through a further growth of the distal lamina, produced the retinal layers. He believes that, on account of the high state of development, the intra-ocular fluid was readily secreted, and naturally tended to sink below, into the spaces of the distal layer, where it found the least resistance. After this reservoir had distended to such a degree that there was no longer any room for it in the orbit, it involved the region of the lower lid, thus producing a cyst of that organ.

Gallemaerts, of Brussels, ⁷⁸ Mar. reports a case of congenital cyst of the lower lid, with microphthalmus, in a child afflicted with hare lip. The tumor was excised, and its wall was found to consist of two layers,—an outer one, resembling the sclerotic, and an inner one, which had a structure that suggested an embryonic retina. The colobomatous cyst occupied the inferior internal part of the orbit.

Huth, of Iserlohn, ²⁵⁴ Jan. has seen a remarkable instance of *binoocular congenital anophthalmus*. The lids and cilia were perfectly developed and there were well-formed conjunctival sacs. The child had a harelip, and the inner canthi showed a disposition to unite with the fissures in the upper jaw. There were well-developed caruncles and two small nodules in the sacs which the author regards as the rudimentary eyes. Harlan, of Philadelphia, ⁹ July 29 describes a case of *congenital cyst of the orbit with anophthalmus* in a well-developed and healthy child 5 months old. The tumor, which filled the right orbit and distended the lids to more than twice their normal size, was incompressible, immobile, and non-pulsatile. There was no trace of corneal tissue. The cilia were normal. An incision made through the cornea gave exit to a large quantity of clear, watery fluid. The cyst was extirpated and proved to be simple, the outer portion being fibrous and tough, and the inner delicate, semitransparent, and bluish. At the bottom of the cyst there was an undefined mass of tissue which bore no resemblance to an eye. The child died twenty-four hours after the operation, and examination of the orbit showed that no communication existed with the intra-cranial cavity. The fellow-eye

was normal. The author considers the tumor as the embryonic tissue of the eye in a condition of hydrophthalmus, or a foetal encysted coloboma, which by its early inception and enormous growth had prevented the evolution of the eye.

Weeks, of New York,^{2139 Jan.} has made a microscopical study of a case of *microphthalmus*, finding that there was an attempt at the formation of an iris apparently over the anterior surface of the foetal vitreous, by the advance of the distal (anterior) border of the secondary eye-vesicle, the latter having formed, apparently, without the development of a lens or a lens-capsule. After the advance of the border of the secondary eye-vesicle, the plate of the mesoblast destined to form the substantia propria of the cornea pushed in beneath the epiblast, and, splitting at the periphery of the cornea, supplied a rather thick plate to the retinal portion of the rudimentary iris which bridged the pupillary space. The space between these two layers became lined with a membrane identical with that of Descemet's, the surface having a single layer of endothelial cells. The author thinks that this specimen apparently demonstrates that the membrane of Descemet and the endothelium are developed from the mesoblast.

Greeff, of Berlin,^{254 Oct.} concludes that the *intra-ocular cysts* with thin walls, that are lined with a single endothelial layer, are never caused by implantation, but are to be regarded as endothelial cysts originating in mesoblastic tissue. He cites an example of multiple cysts of the ciliary body following cataract extraction, complicated by chronic choroiditis. In this case the change was not senile, but was due to atrophy of the ciliary body following an iridocyclitis that was observed clinically. After the extraction of a traumatic cataract, some of the ciliary processes became agglutinated to the ciliary body. Spaces were thus formed in the latter, which, being filled with a serous fluid secreted by the chorio-capillaris, became so disturbed that three large cysts gradually developed. The cylindrical epithelium became converted into a flattened layer. The cysts impeded the flow of the aqueous humor, causing a stagnation in the capillaries of the choroid. The author also gives the notes of a case of a large cyst of the retina, which he thinks was due to an oedema of this membrane caused by a stagnation in the current of the retinal vessels. An instance of *corectopia* with upward displacement is reported by Burnett, of

Washington.²⁴⁹ The pupils were unusually small, and were separated from the ciliary border of the iris by a bridge of iris-tissue. A case of congenital *aniridia* associated with lateral nystagmus has been seen by Brose, of Evansville.²⁴⁹ No pathological changes or congenital anomalies were found in the fundus. Randolph, of Baltimore,⁷⁶⁴ June, July has noted the co-existence of *incomplete iris development*, *glaucoma simplex*, and *zonular cataract* in a man 35 years of age. The iris was absent in the lower and outer five-eighths of its extent, and only a narrow rim of the membrane could be seen above and to the inner side. Both optic nerves were excavated, but that of the right eye, in which tension was markedly increased, was the more pronounced. Both eyes were myopic. The patient stated that his two brothers, an uncle, and two cousins on the maternal side had seriously impaired sight.

A peculiar instance of a congenital *anomaly of the irides and lenses* of both eyes has been seen by Fromaget, of Bordeaux.⁷⁰ Aug. 6 Posterior to the iris below, there was a white plaque, which was intimately associated with this membrane. The plaque was prolonged posteriorly by a conical elongation through the capsule deep into the lens, terminating on the left side in a fine thread. On the right side it ended in a white plaque which was situated in the thickness of the lens. There was nystagmus and atrophy of both optic nerves. Taylor, of Wilkesbarre,⁷⁶ Sept. reports a case of double symmetrical *upward and outward dislocation of the crystalline lenses*. The author considers the condition congenital, as in his experience the displacement has been downward in all cases of traumatic dislocation. A rare case of *spontaneous double lenticular luxation*, occurring in a healthy myopic woman of 45 years, is reported by Deschamps, of Grenoble.¹⁷¹ Nov., '92 Careful examination failed to reveal any local or general cause to explain the condition. The author advances the hypothesis that there may have been congenital malformation of the ligament of Zinn, which ruptured under the increased effort at accommodation consequent upon advancing years. This theory is made especially probable by the fact that one lens was dislocated upward, which the author suggests was caused by a lack of development of the inferior part of the zonula. A case of congenital bilateral symmetrical dislocation of the lenses upward and outward has been seen by Bulson, of Fort Wayne,¹ July 21 in a boy 11 years of age.

Meyer, of Paris, ⁷⁸ Jan. records an instance of a *double colobomatous lens* in a boy of 10 years. One colobomatous area occupied the infero-nasal and the other the infero-temporal segment. There were no other anomalies. The author thinks that the condition can be explained by a failure in the disappearance of the vessels which nourish the lens in embryonic life. Dodge, of Halifax, ²⁸⁴ Oct., '92 has seen a *congenital cataract* in the right eye of a boy whose mother had had a nuclear cataract on the same side. Schiess, of Basel, ²¹⁴ June 1 reports a case of *coloboma of the iris, lens, and choroid* where there was a pupillary membrane. The eyes were myopic, and the zonule of Zinn was normal. Goldzieher, of Budapest, ¹⁹⁰ May has observed an instance of a circum papillary coloboma in an amblyopic eye, which was highly myopic. The author views the condition as being a true staphyloma, into which the nerve had inserted itself. The ophthalmological picture was as though one were looking into a tube the upper wall of which was perpendicular to the opening, whilst the lower gradually approached the upper obliquely until it became merged into the disc.

Pulmacher, of Posen, ¹⁹⁰ Nov., '92 reports another instance of *persistent hyaloid artery*. An *anomalous origin* of the *ophthalmic artery* from the anterior branch of the middle meningeal has been seen by Musgrove, of Edinburgh. ²⁷⁷ Jan. The origin and distribution were much the same on both sides. The remains of what appeared to be a normal ophthalmic artery were found as an impervious fibrous cord, traceable back through the optic foramen to the region of the internal carotid.

Lagrange, of Bordeaux, ⁷⁸⁰ June has seen an instance of *congenital paralysis* of the *rectus externus* of the left eye. He attributes this condition to a lesion or congenital malformation of the oculo-motor nerve.

Bertin-Sans, of Montpellier, ²⁷⁴ Apr. has studied the *influence of age* upon the value of the *rays of curvature* of the *crystalline lens*, making use of a Helmholtz ophthalmometer. The lenses were removed from the eyes of animals about one hour after death. He found that in the same species of animals the rays of curvature of the two faces of the crystalline lens, accommodated for the punctum remotum, increased as the animal grew older, and he states that the same condition doubtless exists in man. As the indices of the crystalline lens increase with age, the far point is brought nearer,

this being offset by the consequent increase in the rays which tends to make the punctum remotum recede. By these two antagonistic factors, the far point is thus kept at a constant distance from the eye. Mörner, of Upsala, ⁸⁸ May 25 has found that nearly half of the lens mass is *insoluble in water* and salt solution, and that this insolubility increases from the outer to the inner layers. The author suggests the name "albumoied" for the unprecipitable proteid substance in the lens-fibres. In regard to the nature of the precipitable albumen of the lens, a part of it can be precipitated by acetic and carbolic acid. A small quantity of phosphorus exists normally in the lens, and senile cataract may possibly be the result of an albuminoid change in the lens-fibres, since the lens, after the loss of its precipitable albumen, does not permit of proper refraction of the rays of light.

In regard to the *anterior chamber* and the *canal of Schlemm*, Rochon-Duvigneaud, of Paris, ²⁷⁴ Feb. concludes that the angle of the anterior chamber in man is homologous to the so-called cilio-scleral space in mammals, which corresponds to the spaces of Fontana. The angle in the human foetus is filled by a fine trabecular tissue exactly equivalent to the cilio-scleral trabeculæ in mammals. This tissue becomes absorbed in adults. He claims to have shown, by comparative anatomy, histology, and embryology, that the cilio-scleral space comprises two different systems of trabeculated tissue: the cilio-scleral and the sclero-corneal. The latter alone persists in man. The canal of Schlemm communicates with the venous system and is a part of it. He believes that it ought to be called the "scleral sinus," as it is similar to the sinus of the dura mater. The anterior chamber is covered by a system of trabeculæ of characteristic structure, probably serving to protect it from any harmful elements which might get into the chamber. The true internal wall of the chamber, however, is formed by a continuous membrane. The author has never seen an open communication between the anterior chamber and the canal of Schlemm, and does not agree with Schwalbe that the latter is one of the lacunæ of the sclero-corneal reticulum.

Scherl, of Dorpat, ²⁰⁴ B.30.II.2 points out that the *first appearance of pigment* in the eye has not only a close relationship with the appearance of the blood-vessel system, but also that it has a most intimate causal connection with it. The absence of the vascular sys-

tem in the interior of the eyes of birds is an explanation of the fact that the first appearance of the retinal pigment in these animals is always on the external surface of the proximal lamellæ; whereas in mammals, where there is a blood-vessel system within the eye, the pigment is found on the internal surface of the proximal lamellæ. He further states that in no instance was pigment discovered before the blood-vessel system had developed; and the pigment was found to develop anteroposteriorly in all animals with a tapetum, the same as in man. The author regards the pigment as a derivative of the coloring matter of the blood, which has gotten into the cells through spaces in the tissue by a process of osmosis. He states that it is a chemical body *sui generis*.

From a careful ophthalmoscopic study of the region of the *macula lutea*, Weymann, of St. Joseph, ¹⁰⁰⁷ _{Dec., '92} concludes that: 1. Except in very old people the macula lutea is easily visible in the vast majority of all persons with perfectly transparent media, provided the observer be thoroughly familiar with the direct method and examine under mydriasis only. 2. The typical form of macula presents a red central dot surrounded by a circular band of whitish color. The red centre corresponds to the foveola foveæ; the white ring, to the fovea or the walls of the crater. 3. The macula needs special adjustment of the ophthalmoscope, since it is usually nearer to the observer than the papilla optica. 4. Secondary (or atypical) forms should not be considered real until after careful focusing. The observer will be surprised to find that such forms more often develop into a perfect "typical" than retain their first appearance. 5. If in a healthy eye the macula present an indistinct appearance, it, very likely, also shows a false image and should be focused correctly. 6. The foveola (red central spot) may be absent, if the slopes are steep and meet at the bottom. 7. The white band may be incomplete owing to the small size (or absence) of the slopes in one direction. The occurrence is quite rare, the corresponding picture being usually resolved into "the typical form" with correct adjustment. 8. Whenever the macula is recognized only by its deeper red and the radiating vessels, its appearance may vary a great deal; a classification is impossible on account of the great irregularity. In seventy eyes examined by Veasey, of Philadelphia, ²⁴⁹ _{July} 58.3 per cent. were found to have pulsating veins, 14.2 per cent. cilio-retinal vessels, and 24.2 per

cent. pronounced physiological excavations. The author gives the percentages found by de Schweinitz, of Philadelphia, in one hundred and thirty-two eyes examined, as follow: pulsating veins, 62.1 per cent.; cilio-retinal vessels, 14.2 per cent.; physiological excavations, 25.7 per cent.

Ziem, of Danzig,⁸ has studied the eyes of many of the lower animals by transmitted light, and claims that by this process the detail of the fundus can be seen by a child, and that the field of observation is much larger than that which is obtained by the ophthalmoscope. As far as the practical worth of the method in its adaptation to enucleated eyes is concerned, the author has found it of value in questions of comparative anatomy, and suggests that it might prove the presence or absence of a tumor in the human eye. By holding the light at the equator of the globe in the living eye, the author suggests the possibility of obtaining a picture of the fundus. Especially is this so in eyes that have been proptosed by a tumor or exophthalmic goitre.

The plan proposed by Tiffany, of Kansas City,¹⁰⁹ of projecting and *sketching* the fundus details upon a gauged sheet situated at a definite distance behind and to one side of the patient, so as to be seen by the fellow-eye, in a manner similar to that employed in drawing by aid of the camera lucida, is very useful, providing the observer is ambidextrous and not presbyopic.

From experiments conducted upon rabbits to ascertain the immunity afforded by preventive inoculation of bird tubercle bacilli against inoculation of the anterior chamber with cultures of Koch's bacilli, Trudeau, of Saranac Lake,¹ _{July 22} concludes that such inoculation can retard and even abort an otherwise progressive localized tubercular process so completely as to prevent destruction of the threatened tissues.

In regard to the microbic nature of *deep ophthalmias* occurring in conjunction with infectious maladies, Gillet de Grandmont, of Paris,²⁷⁴ _{Oct. 192} reports two instances where the eye was secondarily infected with microbes which reached it through the circulation. A pure cultivation of the typhoid bacillus was obtained, in one instance, from a man convalescing from this fever, who was suffering from iritis with posterior synechia and hypopyon. In another case he obtained a characteristic culture of the streptococcus of erysipelas from fluid taken from the anterior chamber

of the eye of a woman who was recovering from a third attack of erysipelas. He also cites an instance where the condition of the eye sufficed to justify the diagnosis of septicæmia before the onset of a peritonitis, from which the patient died forty-eight hours later. The author concludes by urging, first, that in cases of inflammatory disturbance in the interior of the eye the cause is sometimes to be found in antecedent infectious diseases of the system; and, secondly, that in cases of diagnostic difficulty the question should be decided by paracentesis followed by bacteriological examination.

From the study of five cases of *metastatic inflammation* of the eye, Herrnheiser, of Prague,²⁵⁴ has found that the choroid and retina were both affected, the former usually to a greater degree. In two instances the streptococcus pyogenes was detected. In one case the author viewed the first stage of the inflammation following the lodgment of an embolus. The spot of infiltration, which at first was but one-fifth the size of the disc, became five times larger in twenty-four hours. In regard to retinitis septica, the author concludes that it is much more frequent than panophthalmitis, which is quite rare in puerperal fever, and that the disease is remarkable on account of its benignity, the retinal areas of inflammation being small and showing no tendency to spread to neighboring parts; this latter quality depends upon the fact that this form of inflammation is not embolic, and that the inflammatory areas are due to chemical changes in the blood.

Forger, of Louvain,²⁷⁴ Nov., '92 has had an opportunity of making a *microscopical study of an enucleated stump* that had been allowed to remain after an evisceration for the relief of acute glaucomatous attacks, consecutive to a very large corneal ulcer. At the time of the second operation the globe was allowed to fill with blood, as suggested by Schede, and an organization of the clot aimed at. Upon account of sympathetic symptoms which had appeared in the other eye, the stump was removed two months after the primary operation. Microscopical examination revealed the following condition: The sclerotic was enlarged; its structure was looser and less fibrous. Its connective-tissue fibrillæ were removed by a hyaline substance. The cavity within the fibrous envelope was reduced to a very narrow space, which was filled by the remains of the clot. The coagulated mass was represented by a number of migratory

cells, some of which contained pigment. A number of capillaries which came from the ciliary region and the neighborhood of the optic nerve ran through the remnant of the clot. The author concludes that the contraction of the soft connective tissues, with which the globe is filled after evisceration, predisposes toward sympathetic ophthalmia by implicating the young nervous filament of the ciliary region, and that, therefore, the operation should be discarded.

PHYSIOLOGY.

In a very careful study, Presas, of Barcelona,¹⁷¹ Nov., '92 suggests the reform notation of instruments used in physiological optics to a decimal standard. He divides the sphere into 400 degrees, each quadrant being composed of 100 degrees. For accuracy in studying the field, the instruments for each eye should be different. The zero point is placed at the inner portion of each eye, and the numbers increase as they approach the vertical meridian. The author believes that the adoption of a decimal and symmetrical notation for all instruments, as first suggested by Knapp, would render the whole system of optics uniform and would be of the greatest advantage in locating scotomata, and in indicating the axis of astigmatism.

With a view to determine whether there is any relationship between the curvatures of the cornea and the sclerotic in the horizontal meridian, Burbo⁷⁸ Feb. has measured these meridians in a number of eyes, making use of the instrument devised for that purpose by Meyer. The author has found that (1) flattening of the sclera is greater on the nasal than on the temporal side (except in 7 cases in 100); (2) the degree of flattening varies but little in emmetropic eyes, whilst in astigmatic ones it appears to increase with the degree of astigmatism; (3) the radii in the right eye are slightly (0.1 millimetre on an average) longer than in the left. The author concludes that the corneal flattening corresponds directly with that of the sclera, this being more marked on the temporal than on the nasal side.

In order to measure the *spherical aberration of the living eye*, Leroy, of Paris,⁷⁸ Mar. makes use of the following procedures: He seats himself fifty centimetres from the eye under examination, and produces a shadow from it by means of a mirror of "0.25" of convexity. This mirror is made with a small central hole.

Lenses from the trial-box are then brought successively into the plane of this hole, bringing the sections of the luminous bundles into view. The analysis of the various bundles is accomplished by observing the mobility of the pupillary illumination by means of a transverse displacement of the pencil, produced by a displacement of the mirror.

Boerma and Walther, of Leipzig, ²⁰⁴_{B.39, H.2} have examined 725 eyes in 400 individuals between the ages of 40 and 80 years, and have found that the average *visual acuity* for each five years of life is as follows: For the five years ending at 45, 6.15 to 6; at 50, 6.01 to 6; at 55, 5.94 to 6; at 65, 5.55 to 6; at 70, 5.16 to 6; at 75, 5.26 to 6; at 80, 4.50 to 6. This shows that there is a regular decrease in visual acuity as age advances. Comparing the results of the authors with those obtained by Donders, it was found that their figures noted a higher visual acuity at advanced ages. All eyes subject to pathological change were carefully excluded from the examination.

Oliver, of Philadelphia, ²⁴⁹_{Apr.} has enumerated the advantages of the *test-letters* reproduced in miniature in the accompanying cut as follows: 1. "The letters chosen in this series of test-type strictly conform to the five-minute angle-basis of Snellen, not only in height, but also in width. Each letter has its component parts included absolutely in the one-minute angle-limit of vision. The interspaces throughout the letter-area are also kept to the one-minute basis or more. The individual portions of the letters are blocked into their proper areas, thus avoiding the mental effort necessary to decipher complicated forms, and escaping the visual



NEW SERIES OF TEST-TYPE. (OLIVER.)
Archives of Ophthalmology.

confusion produced by intricate characterization. 2. Each row of type has an intentional sequence of letter-formation, which alternately expresses vertical and horizontal strokes, and curved ones, thus giving a series of characters which serve for the ready detection of astigmatism. 3. Each test-type is placed in the centre of a surrounding area, which is either greater or equal to the size of the letter itself. This has been done so that the test-types can in no way interfere with one another, thus preventing, just as was obviated with the parts of the individual letters, any confusion by too close approximation of the entire letter-groupings themselves. 4. Each line of test-type has been made of a size that should be seen at five metres or even fractional multiples thereof, thus avoiding any useless mental calculation for the various values."

Grenouw, of Breslau,⁵⁸⁵ has performed a number of experiments to test the statement of Schiele that there is an homonymous concentric narrowing of the field carried over from a similar narrowing in the fellow-eye as the result of fatigue, and concludes that the curves produced by fatigue were never so regular, but crossed one another everywhere; by tiring one sector in the field there were nearly always changes in the external limits elsewhere in the same eye, and only in a certain number of cases did the homonymous portion of the field of the second eye show analogous changes in its external limits to those produced by fatigue in the first eye. In conclusion, the author states that his experiments do not warrant his acceptance of Schiele's statement that the so-called fatigue of the retina was due to fatigue of the cortex of the occipital lobe.

After pointing out the fallacies in the results obtained by the usual methods of perimetric examination of the visual field for colors, Hegg¹⁷¹ May concludes as follows: 1. The perimetry of colors is not the equivalent of a determination of the peripheral sensibility of the retina opposite the colors, because this latter determination only allows one intensity of irritation for each color. 2. Nevertheless, the diverse colors constitute different intensities of irritation, and each color taken by itself represents the extreme limit of the points of the retina which perceive it, the minimum amount of irritation for these points. 3. The sensibility of the retina for colors diminishes progressively from the centre toward the periphery. Any point on the retina is more easily irritated by the blue and

the yellow than by the red and green. The macula is an exception to this rule. 4. The cause of the diminution in the sensibility toward the periphery should probably be looked for in the sensory elements of the retina itself. 5. In affections of the conducting apparatus (optic nerve) one can form a conclusion upon the excentric visual acuity, according to the relation of the colored visual fields, but only when the refracting media project a clear image upon the retina. 6. The perimetry of colors permits of a judgment of the continuity of the visual field. It takes the place of an examination of the peripheral visual acuity. 7. All colors may be divided into two groups,—(a) those toward the periphery passing from a neutral gray into blue, (b) those toward the periphery passing from a neutral gray into yellow. 8. The cause of this is that the blue and the yellow occupy the most extensive part of the visual field. The chromatic combinations, red and green, in which the blue rays predominate, appear blue in the peripheral portions of the retina insensitive to the other elements of the combination (red and green). The combinations, red and green, in which the yellow rays predominate, appear yellow outside of the limits of the red and green, because these parts are still sensitive to the yellow rays, after they have ceased to be so for other rays. All of the colors of blue and yellow vary in their tints according as they are removed from the periphery, but only to the limit of the red and green. Beyond this limit they vary only in their saturation and not in their tint. 9. All colors employed up to this time in perimetry have varied in their tint as well as in their saturation, according as they are moved from the centre toward the periphery. They should not, therefore, be used. 10. When the colored discs are removed from the centre toward the periphery, they should vary only in their saturation and not in their tint. These are called *invariable colors*. 11. The invariable colors can be rendered equivalents, two by two, and they may be given the same value of white. 12. The red field is equal to that of green, that of blue to green, when the fields are determined by invariable colors which possess the same chromatic and white values. 13. The only investigations which can claim to be scientific are those executed with the invariable colors of the same white value. 14. The patient cannot tell, from the brightness of the pigments, what the color is, and can only judge of the limits

of his perception by the color, and not by the difference of tones which are mixed in with it. 15. The background on which these experiments are made ought to have the same white value as the objects of examination. 16. The "calotte" of Schenck, modified by Pflüger, is the best perimeter we possess, but its background should not be black.

Wolfberg, of Breslau,²⁵⁴ points out that two distinct meanings are conveyed by the word "light-sense." In the ordinary acceptance, this term is used to mean nothing more nor less than the adaptation of the retina to rays of light, this adaptation depending upon photochemical change. By the term "color-sense," however, the author means the adaptability of the perceptive nervous structure of the eye. He thinks that his apparatus is particularly well fitted to test this latter. In order to obtain the numerical determination of the sense of light, Ole Bull, of Copenhagen,¹⁷¹ has prepared a series of pigments, corresponding to those on Masson's discs, by the employment of white sectors of variable extent on a black background. An inferior limit was fixed by taking letters which subtended an angle which was just visible to the normal eye. By means of a comparison with the photometrical table, the value of the light-sense could be detected in each instance. The author makes use of four shades which he calls principal physiological colors. White was made to weaken blue, and caused the mixture of red and of green to appear more marked. He has further classified pathological alterations of the color-sense into three categories: (1) the lowering of the sense of color to the same degree for the four principal colors; (2) the lowering of the sense for red and green while it remains normal, or but little affected, for blue and yellow; (3) the confounding of shades of green with those of blue, and those of yellow with red, at the same time that the yellow and the red appear deeper-colored than the blue and the green. The first of these alterations was found to accompany affections of the optic nerve and circulatory disorders of the retina. The second occurred in certain forms of primary atrophy, as in amblyopia from tabes or from nicotine. The third was associated with all these disorders when the sense of light was considerably decreased, as, for example, in retinitis pigmentosa.

Charpentier, of Nancy,⁴¹⁰ has found that every luminous excitation provokes a series of oscillations in the retina, of which the

first negative phase is the more generally noticed. This arises one-sixtieth or one-seventieth of a second after the beginning of the excitation; so that the period of each complete oscillation is one-thirtieth to one-thirty-fifth of a second. It is transmitted at a velocity of about seventy-two millimetres a second. Stevenson, of London,^{Feb. 18} directs attention to the fact previously noted by Robertson, of Newcastle-on-Tyne, that when an electric lamp of sufficient power is introduced into the mouth the interior of the eye becomes luminous.

Dantec⁷⁰ has observed a curious class of phenomena to which he gives the name of "colored sensibility." He has observed that irritation of the skin over anæsthetic areas in hysterical subjects will produce a color differing according to the degree of excitation. The color so produced he calls "spectre." As this phenomenon could only exist when the peripheral sensitive nerves are active, the author points out that its presence would be of great value in a differential diagnosis between an organic anaesthesia and an essential or *sine materia* anaesthesia. Concerning the probable theory of the causation of the *spectre*, the author concludes as follows: The colored sensibility is the transformation of a phenomenon of the general non-differentiated sensibility into a phenomenon of special differentiated sensibility. This phenomenon occurs in a remarkable degree in hysterical anaesthetics, and the color of the *spectre* varies not only according to the degree of excitation, but also in different individuals. Thus, the pinch of the skin that produces red in some subjects would produce green in others. The *spectres* vary according as the upper or lower extremity is excited. The coloration is more marked when the stimulus is stronger, and is usually more intense in the eye of the side that has been irritated. Certain pathological phenomena, like sensory auras of partial epilepsy (colored vision, phosphenes), and like the scintillating colored vision of migraine, probably fall under the same category as the foregoing. The phenomenon of the *spectre* can be explained by the transmission of the peripheral excitation to the centre of general sensibility, and from there by irradiation to the visual centre, which is doubtless near. Hilbert, of Sensburg,²⁵⁴ believes that the so-called fantastic appearance of spectral forms is explained in the following manner: The centre of our power of representation and the visual centre are always in a stage of perpetual activity; and

as the excitement of one sense in certain individuals will often have an effect on some other sense, so the reception of objective and even of subjective visual sensations causes the associated action of incongruous representations, which, being projected toward the outer world, after the law of excentric projection, cause a change or remodeling of the retentive visual impressions. Buxton, of London, ^{July 15}⁶ has modified his *telechrome* so that the wool- and lantern-tests may be combined. For this purpose the contrivance is fitted with disc-carrying glass plates, which by gaslight show the following colors: pale grass-green, pale rose, bright red, bright blue, signal green, and yellow. The instrument is placed in a darkened room fifteen feet from the patient, who remains in the daylight, and matches the test-skeins with the colors as they are displayed in the lantern, under varying degrees of light-intensity. Oliver, of Philadelphia, ^{Sept. 2}⁹ has introduced a *simplified series* of eighteen wools of equal relative intensity, in which the value of the colors is so expressed and the sets so constructed that they can be used by any educated layman, thus making it not only of practical value to every ophthalmologist and neurologist, but of use to experts in marine and railroad service.

According to Maddox, of Edinburgh, ⁷⁶_{May} if light be reflected into the eye from the mirror of an ophthalmoscope held at a distance of about one foot, while the patient looks at the aperture in the mirror, the position of the light-reflex on the cornea gives a fair idea of the size of the angle "a," and simultaneously a means of noting the amount of eccentricity of the fovea, as the greater the distance of the reflected image from the centre of the cornea, the greater is the distance of the macula from the posterior pole of the eye, and in all probability the greater is the hypermetropia. Bach, of Würzburg, ⁶⁸_{Nov., '92} has discovered that it is possible to produce a *conjugate deviation* in the eyes by turning them on their vertical axis. This phenomenon is accounted for by the fact that an impulse goes from the centre of associated movements to the ocular muscles producing the different movements. By the repetition of the impulse, a cumulative action is produced which finds expression in a longer innervation of the muscles, during which the eyes try to deviate. The antagonistic muscles are now relaxed, and if the impulse of innervation cease, and the patient is told to look straight ahead, the balance of the muscles is restored by a few

backward motions of the antagonistic muscles. These motions are naturally conjugate deviations in the opposite direction. From a study of the *reaction of the pupil* in a series of cases of nervous diseases, Turner, of London,⁴²³ is led to suggest the following subdivision of the fore-part of the oculo-motor nucleus: "1. A sphincter-inhibitory centre, closely associated with a sphincter-contracting centre, which two subserve the pupillary light-reflex. 2. A centre for accommodation. 3. A centre for contraction of the pupil with convergence, in close association with the centre for the associated action of the internal recti muscles."

Brown-Séquard, of Paris,⁴¹⁰ believes the dilatation of the pupil is caused by an act of inhibition, not by muscular contraction.

Oliver, of Philadelphia,²⁴⁹ has had constructed a new series of *test-words* for the determination of the power of accommodation, which possess the following advantages: "1. Each word is composed of three or four letters constructed in strict conformity with the Snellen basis of letter-formation, thus not only avoiding any errors that might arise from improper characterization, but actually placing the results upon the same basis as those that are obtained during testing for distant vision. 2. Each column of words, just as in the rows of test-types for distance, has a purposive succession of test-words alternately composed, as much as possible, of letters preponderant in horizontal and vertical strokes, and in curved ones, thus allowing the tests to be of great value in the ready recognition of astigmatism. 3. Each grouping of letters is composed of a different series of words which bear no relation to one another, thus preventing any power of memorizing, and any imperfections in result that might arise from context. 4. Each test-letter, just as in the larger series, is surrounded by a free space, which is either equal to or greater than the area that is occupied by the letter itself, thus greatly obviating any confusion that might arise from interference of one letter with its fellow. 5. Each grouping of test-words, which has been made sufficiently great so as to allow an adequate change of choice of selection during testing, is graded to a size that permits of easy and quick computation. 6. The letter-surface of the card is surrounded by a broad, raised border of rough, gray card-board, thus, in great measure, preventing the print from being soiled by handling or by contact with any dirty surface."

SECTION II.

ERRORS OF REFRACTION AND ACCOMMODATION.

Alfred Michel, of Bern, ³⁵³ July, Aug. has studied the *power of the eye to overcome an astigmatism*, induced by placing cylindrical glasses of different strength before it. The author made use of his own eye in the experiments. He has 2 dioptres of myopia, and a corneal astigmatism of $\frac{1}{2}$ dioptre. There was an accommodation of 9 dioptres when the test-object was placed at two and one-half metres distance, and his refraction was corrected by —S. 2 dioptres. He was able to overcome a 1.25-dioptre cylinder strength in the vertical and horizontal meridians, while he could only overcome a glass of 1 dioptre when it was placed in one of the oblique meridians. When the pupil was acted upon by cocaine, the same cylinders were overcome, but after a considerably longer time. The test-object was then placed at the far point of the eye, whilst the organ was but partially corrected (—S. 1.5 dioptres). In this experiment the same glasses were overcome with less promptness than in the first. The small test-object was then held at the far point of this uncorrected eye (fifty centimetres) and the same results were obtained as in the former series. When the test-object was held at the far point of the higher refracting meridian, similar results ensued. The author found that a 3.2-dioptre contact glass overestimated his myopia, requiring +S. 6 dioptres to be added for perfect spherical correction. His corneal astigmatism was also corrected, and his lenticular astigmatism was made manifest, requiring a —0.50 cylinder, axis vertical, to be added to complete the correction. The same results in overcoming glasses were obtained as in the preceding instance. After 4 dioptres of his accommodation had been paralyzed with homatropine, it was found that he overcame 0.50 dioptre of cylinder-action lens in each meridian. Guilloz, of Nancy, ¹⁴ Aug. believes that the lens has the power of overcoming cylindrical lenses independent of any spherical accommodation. Without giving any hypothesis in regard to the mechanism, the author shows the existence of a case of astigmatism due to accommodative effort on the part of the lens which varied according as the optical conditions of the eye changed. A majority report of a committee consisting of Thomson, Harlan, and Risley, appointed by the Section on Ophthalmology of the College of Physicians of Philadelphia, to report upon the designation of the

meridians of astigmatism, recommended the adoption of the system of placing the zero at the nasal extremities of the horizontal meridian in each eye, with the degrees graduated on the upper semi-circle, so that 180 degrees will fall at the temporal extremities. Risley presented a minority report, in which he recommended an adherence to the present method of designation.

From a careful study of the eyes of the students in the gymnasium at Minden, Ohlemann²⁵⁴ found 60 cases of myopia among 293 individuals, or 20.5 per cent. In 36 instances this error was due to heredity. Myopia 1 to 3 dioptres occurred in 39 cases, or 65 per cent. Myopia 3 to 6 dioptres appeared in 14 cases, or 23.3 per cent. Myopia greater than 6 dioptres occurred in 7 cases, or 11.5 per cent. Of the remaining eyes that came under examination, 69.5 were emmetropic, and but 9 per cent. were hypermetropic. Anisometropia occurred 14 times, and always appeared as an emmetropia in one eye and as a myopia of 1 to 2 dioptres in the other; the left eye being the myopic organ in 6 cases. Red-green color-blindness was found in 3 instances. More cases of myopia were found in the higher classes than the lower, and instances of higher degrees of the disease were also found among the more advanced scholars. From the examination of the eyes of scholars in the schools of Geneva, Sulzer¹⁹⁷ Jan. 20 concludes that the system of instruction pursued is most prejudicial to the scholars. Myopia is the most serious consequence of this lack of hygiene. The author believes that a commission should be appointed, consisting of teachers and physicians, who should have charge of the methods of tuition, of the character of school-furniture, and of the materials for instruction. The introduction of upright handwriting, the separation of the instruction of reading from that of writing, a better division of rest and labor,—that is to say, of intellectual and bodily work,—should be the principal points submitted to the commission. Southard, of Oakland⁴⁴ Oct. 92 has examined the eyes of 311 students in attendance at the California University. Of this number, 34.35 per cent. were emmetropic, 35.63 per cent. hypermetropic, 6.09 per cent. myopic, and 23.77 per cent. astigmatic.

Belt, of Washington, D C.,⁸¹ Aug. has examined the eyes of 210 pupils in the public schools of Washington, D. C., and has found 58.8 per cent. of emmetropia, 21.9 per cent. of hypermetropia, 19.5 per cent. of myopia. Errors of 0.50 dioptrre or less were not

considered, except in astigmatism; .005 per cent. of the pupils were color-blind, all being males. By comparing the results obtained in the three lowest grades with those of the three highest grades, there would appear to be an increase of 0.1 per cent. in the emmetropes, a decrease of 0.14 per cent. and an increase of 0.13 per cent. in the myopes.

Roosa, of New York, ⁵⁹ Nov. 26, '92 has made an analysis of the eyes of 100 persons who did not complain of symptoms of asthenopia, and with normal vision, and has found but 5 free from astigmatism in both eyes and 7 with astigmatism in but 1 eye. Hypermetropia was present in all but 9 cases. Of 11,000 eyes examined subjectively and objectively with dilated pupils, Herrnheiser, of Prague, ¹³ Mar. 16 found 56 per cent. to be hypermetropic. Of 1920 eyes of infants, all were found to be hypermetropic with the exception of 1, where the organ was in a state of hydrophthalma. The author thinks that the average degree of hypermetropia in infants is 2.30 dioptres, whilst between this period up to the sixth year the average refraction is 1.95 dioptres. Of 546 eyes of this latter period, 24 were found to be myopic. The latter condition was found to increase very markedly between the thirteenth and twentieth years, when it became stationary.

Batten, of London, ⁶ July 16 considers four forms of myopia: acute, chronic, progressive, and stationary. In the chronic form a "thin choroid," rendering the choroidal vessels visible and occasionally associated with fine dust-like opacities in the vitreous, is attributable to cardio-vascular disturbances, while a condition in which the pigment appears to be divided into islands is due to strumous or specific disease. He considers central physiological cupping of the disc to be a form of staphyloma, and this condition, together with distortion of the vessels, commencing crescents, and astigmatism, to be early premonitory signs of myopia. Randall, of Philadelphia, ⁷⁶ Sept. is of the opinion that no positive statement of the significance of the Weiss reflex can be made. He has found it conspicuous in some cases of distending eyeballs, absent in some cases of progressive myopia, and present in eyeballs showing no tendency to distension. It is most easily detected by employing a strong concave mirror.

Bass, of Freiburg, ²⁵⁴ Dec., '92 has made a microscopical study of nine myopic eyes, in eight of which the appearances were similar to

those already reported in the description of a myopic eye of high degree by Weiss and Stilling. An embolus of the central artery of the retina had occurred in the ninth eye, followed a few days later by acute inflammatory glaucoma. The sections of this case showed a high-grade atrophy of the optic nerve, the retina being similarly affected, but to a less degree. A glaucomatous excavation, associated with but little infiltration, was also seen. From the fact that the sclera was much thicker posteriorly than in the eight preceding cases, the author concludes that previous to the glaucomatous attack the myopia had probably been one of low degree. From a comparison of the thickness of the sclera in hydrophthalmic eyes with that in myopic ones, he points out that in the former class of cases the thinning occurs anteriorly as well as posteriorly, while in myopia it occurs only in the latter position; further, that changes may occur, in the course of a myopia of moderate degree, that will convert it into one of high degree without any attending inflammatory process. Sulzer, of Geneva,¹⁷¹ July has found that myopia occurring in school-children develops unequally in the two eyes, and seeks the explanation in the oblique position in which the head is held whilst the patient is seated at the desk.

Bronner, of Bradford, June⁶,¹⁰ describes a condition of *nervous ocular asthenopia*, not dependent upon ametropia, occurring in school-children who are neurotic, either as the result of heredity or a long-continued or severe illness. In some instances the exciting cause appears to have been a slight injury to the eye. The symptoms of ametropic asthenopia are present in association, at times, with decided impairment of vision, which is variable and markedly influenced by very weak lenses. In many cases slight ptosis or strabismus exists. The range of accommodation is usually normal, but continued reading is only accomplished by frequent shifting of the position of the book. The field of vision is usually contracted. Cross, of Bristol, June¹³¹, reports a typical form of asthenopia occurring in non-hysterical young women, which is not influenced by the correction of existing refraction anomalies. The essential element is a tendency to active hyperaemia of the face and neck, increased by hot rooms, excitement, and study, and accompanied by coldness of the hands and feet. Treatment is to be directed toward the circulation and the generative and digestive organs.

Ray, of Louisville, ⁷⁶_{June} has observed *monocular amblyopia* with astigmatism in a father and four daughters, while ametropia of a marked degree existed in four of the grandchildren.

Hawley, of Chicago, ¹⁰¹⁸_{Apr.} has seen a series of cases of *reflex disturbances*, apparently due to ocular strain, relieved by the proper glasses. Baker, of San Diego, ⁴⁴_{Jan.} reports a case of *mental derangement*, in a woman 46 years of age, promptly relieved by the correction of an existing mixed astigmatism.

Bates, of New York, ⁵⁹_{Feb. 25} cites an instance in which *asthenopic symptoms*, which had been aggravated by the wearing of gold-frame spectacles, were relieved by so changing the nose-piece as to prevent it coming in contact with the skin.

Herron, of Jackson, ¹⁰⁰⁷_{Jan.} gives the notes of a case of *recurrent attacks of sneezing* apparently due to eye-strain, as the correction of an existing ametropia resulted in the subsidence of the paroxysms. Baker, of Utica, ²⁷⁸_{Apr.} has seen several cases of *psychalgia* relieved by the correction of existing errors of refraction.

Bigler, of Philadelphia, ¹⁰¹⁸_{Jan.} observes that in treating *anisometropia* it is very rare to find objections to perfect correction of each eye, especially where the acuity of vision is the same in both, and where the difference in the ametropia is in degree and not in kind.

Falkenburg, Groningen, and Straub, of Utrecht, ²⁵⁴_{Apr.} have observed that a majority of *congenitally amblyopic* eyes have a total and manifest hypermetropia of from 1.5 to 2 dioptres, amblyopic hypermetropia being the normal refraction which has become manifest through the loss of function. They have also prepared comprehensive tables showing the degree of hypermetropia in amblyopic cases, the refraction of normal eyes after energetic atropinization, and the relationship of eyes that have been atropinized to amblyopia. Gould, of Philadelphia, ⁹_{Dec. 31, '92} records a series of cases of amblyopia from disuse, in which vision was greatly improved by correcting the ametropia, re-instating the muscular balance, and exercising the defective eye. Standish, of Boston, ⁹⁹_{Oct.} asserts that the vast majority of headaches can be relieved by properly correcting the error of refraction, leaving but a few cases in which operation upon the muscles is absolutely necessary for the relief of the nervous phenomena.

From a careful study of the principles of *keratometry*, Weiland, of Philadelphia, ²⁴⁹_{Jan.} arrives at the following conclusions: " 1.

Keratometry is a very valuable method for the finer diagnosis of the actual construction of the eye. 2. The cornea having been measured not in the visual line, but in the optical axis of the eye, we find: (a) the direction of the two main meridians of the cornea; (b) the radii of curvature in these two main meridians at 1.25 millimetres, or about ten degrees to either side of the corneal point looked at, the result being the more incorrect the more astigmatic the cornea; (c) the cylinder that would correct the corneal astigmatism, if placed directly in contact with the cornea, and if the remaining part of the cornea not examined by the instrument does not deviate much from the employed area of the cornea; (d) the cylinder that would correct if placed at the usual distance from the eye. 3. In cases where the corneal astigmatism differs much from that of the whole eye, especially where there is no A_c , but considerable A_o , we may then find: (a) the axis of the lenticular astigmatism; (b) the amount of the crystalline astigmatism; (c) the sphere resulting from the combined action of the corneal and lenticular astigmatism."

Deynard, of New York, ⁴⁶² _{Dec., '92} directs attention to the value of the ophthalmometer in the correction of astigmatism in amblyopic eyes. In cases of irregular astigmatism, Eaton ⁵⁹ _{Nov. 12, '92} has found the ophthalmometer of value in revealing the most regular meridian. In one hundred and seventy-one eyes in which a comparison is made between the amount and the axis of astigmatism as estimated by the ophthalmometer, and as determined by the test-types under a mydriatic, de Schweinitz, of Philadelphia, ⁷⁶⁰ _{Nov. 19, '92} found exact correspondence of the axes in 88.9 per cent., and of the amount in 25.7 per cent. The author shares the opinion of Burnett that this instrument is one of the most important which has been given to us since the invention of the ophthalmoscope.

Truhart-Fellin, of Wenden, ²¹ _{Mar. 4} points out the value of *skiascopy* to the general practitioner as an easy and sure way of determining refraction. He prefers the plane mirror, and stations himself one metre distant from the patient. Stannard, of Chicago, ¹⁰¹⁸ _{Jan.} is convinced of the futility of endeavoring to accurately measure hyperopia and hyperopic astigmatism, in patients under 40 years of age, without the use of a mydriatic. Minney, of Topeka, ¹⁰⁰⁷ _{Aug.} gives the following summary of the practice adopted by twenty-two ophthalmologists in the employment of a *mydriatic* in estimating

errors of refraction. Five use a mydriatic in all cases of refraction; two in 90 per cent. or over; three in 20 per cent.; six seldom use it, and six do not employ it as a routine practice. Five use atropine in 75 to 100 per cent. of the cases; seven homatropine in 65 to 100 per cent. In regard to the treatment and correction of astigmatism, Knoepfler, of Nancy, ²⁷⁴ Nov., '92 concludes as follows: In general, the difference of action in two meridians of the cornea for any distance is represented by the difference in dioptries of each meridian,—that is to say, by the astigmatism. It is, therefore, the half of this difference, or of the number expressing the astigmatism, which should seemingly be given to the meridian that does the most work. The clinician should be able, by aid of the spherical lenses properly adjusted for the occupation distance of the patient, to so arrange them that the work in each meridian should not exceed that of an emmetrope for the same distance, or should be even inferior to it. Coleman, of Chicago, ¹⁰¹⁸ Jan. has compared the results obtained in forty-one eyes in repeated tests of the refraction with discs of homatropine and cocaine, and has found that in twenty-one instances the revealed error was greater after the second test. A comparison of the results thus obtained, with those found under atropine, showed that in $8\frac{1}{2}$ per cent. the discs had failed to disclose the true state of refraction.

Risley, of Philadelphia, ¹¹² Jan. states that incomplete investigations seem to show that the atropine of commerce is, in fact, hyoscyamine, and that much of the hyoscyamine is really atropine. The author prefers hyoscyamine for estimating refraction errors, especially when there is retino-choroidal irritation, but in the absence of this condition he employs hydrobromate of homatropine. In very high degrees of astigmatism, Milliken, of Cleveland, ⁷⁶ Sept. has found the ophthalmoscopic estimation the most satisfactory method for determining the refraction error.

Savage, of Nashville, ¹⁰⁰⁷ May has embodied as follows his conclusions in reference to the management of cases of *ametropia associated with heterophoria*, where nothing is done for the direct relief of the muscle error: "1. Give a full correction of hypermetropia when associated with esophoria. 2. Give no correction, or only a partial correction, of hypermetropia when associated with exophoria. 3. Give a full correction of myopia when associated with exophoria and when there is orthophoria. 4. Give only a partial

correction or none at all of myopia, when associated with exophoria. 5. A full correction of hypermetropia cures a pseudo-esophoria in esophoric cases, and creates a pseudo-exophoria in exophoric cases. 6. A full correction of myopia cures a pseudo-exophoria in exophoric eyes and creates a pseudo-esophoria in esophoric eyes. 7. In hypermetropia associated with internal strabismus, fully correcting lenses, aided by mydriatics, remove all pseudo-esophoria and thus make it possible for the guiding sensation to resume control of the converging centres in such a way as to restrain the true esophoria, and thus cure the strabismus. 8. In myopia associated with exotropia, fully correcting lenses, with myotics, will remove pseudo-exophoria, and thus make it possible for the guiding sensation to restrain the true exophoria and thereby cure an external squint. 9. Any test for lateral heterophoria, within the first few hours after beginning a mydriatic, is wholly unreliable even with lenses on."

Jackson, of Philadelphia,^{1007 June} claims that a combination of a convex cylinder and a concave cylinder of equal strength, or their optical equivalent, spherocylindrical lens, is a valuable addition to the lenses usually found in trial-boxes. The lens is held before the obtained approximate correction in such a manner as to increase or diminish the spherical or cylindrical surfaces without necessitating the removal of the trial-lenses. The same author^{1018 July} gives some practical rules to aid in the rapid and accurate determination of refraction errors by means of test-lenses.

Würdemann, of Milwaukee,^{76 Sept.} directs attention to the value of bifocal lenses for aphakic eyes. He believes that the prismatic effect of the lenses can be avoided by appropriate decentration.

Dor, of Lyons,^{78 Nov., 1902} has found the contact-glass, as suggested by Sulzer, to be of service in cases of very marked irregular astigmatism and in keratoconus, with or without leucoma, and in rendering an immediate diagnosis of irregular astigmatism possible. Roth, of Berlin,^{254 July} has seen marked improvement in the vision of patients, where the corneal surface was distorted, by the use of so-called "sieve-like" spectacles. He states that the three holes in the metallic disc should be equally distant from one another. This is accomplished by making them form an equal-sided triangle. The metal between the two holes should be as large as the pupil of the patient.

In an interesting article, entitled "Some Ocular Perceptions, and How They are Influenced by Lenses," Phillips, of Philadelphia,^{1018 Jan.} treats at length of the subject of *metamorphopsia*, resulting from the wearing of glasses for the correction of errors of refraction. He directs attention to the fact that the disturbance of perception in the correction of myopia is of greater practical importance than in hyperopia, as stronger glasses are more frequently required and reduction in the size of the retinal image is felt to be a disadvantage, which is not the case with their enlargement.

Friedenwald, of Baltimore,^{254 Apr.} has found that the binocular metamorphopsia produced by correcting lenses is due to the axis of the cylinder, and points out that the same condition may be caused by a monocular paralysis of the accommodation.

SECTION III.

DISEASES OF THE ORBIT.

Watson, of London,^{6 May} reports a case of *mucocoele of the frontal sinus* in a strumous woman 25 years of age. The patient complained of great pain in and about the left eye and frontal region. She also had double vision. Examination showed a brawny swelling of the left upper eyelid, more marked below the inner orbital margin, where the lid was red and sensitive. The eye was displaced downward, causing crossed diplopia. The preauricular and submaxillary glands upon the left side were enlarged and tender. Under expectant treatment all the symptoms improved, and two weeks later a copious, thin, yellowish discharge occurred from the left nostril and continued several days in diminishing quantity. Examination revealed a polypoid enlargement of the left upper and middle turbinates.

Hoppe, of Göttingen,^{353 v.31, p.100} has seen a fatal case of *empyema of the frontal sinus* with exophthalmus in an otherwise healthy man, 55 years old, who, for six years, had suffered from toothache, necessitating the removal of several teeth. Later, a swelling of the right cheek manifested itself. Two years before he was first seen a purulent fetid discharge from the right nostril, associated with a recurrent exophthalmus on the same side, appeared. When the patient looked to the left and upward, diplopia occurred. On the inner and upper part of the orbit a soft, tender tumefaction

could be felt. Pressure on this swelling caused a purulent discharge from the right nostril. As febrile symptoms set in, an incision was made above and inside the internal canthus, giving exit to a large quantity of pus. Although the case did well for a time, a fatal meningitis ensued. The author thinks that the disease, which was produced by carious teeth, originated in the antrum of Highmore. From there it spread to the middle meatus and frontal sinus, causing perforation in the orbital wall of the latter. Pressure of the swelling, probably with slight orbital cellulitis, produced the exophthalmus. Martin, of Bordeaux, ¹⁸⁸ _{July 50} points out that the use of the catheter is the only means for arriving at a diagnosis in cases of empyema of the frontal sinus, as he reports an instance where the increased nasal secretion was absent and where the electric light revealed no difference in the density on either side.

Walter, of Odessa, ²¹ _{Feb. 25} has removed an *angioma of the orbit* with conservation of the globe. The tumor was situated outside of the ocular muscles. Microscopic examination showed the growth to be an angioma cavernosum. The presence of nests of cells of a lymphoid and epithelial character, and the diffuse infiltration of the tumor with round-cells, suggested an inflammatory condition in the neoplasm. In regard to the liquid contents of *congenital serous cysts* of the orbit, Fromaget, of Bordeaux, ⁷⁰ _{Feb. 5} concludes that in no instance has there been any evidence of its being cerebro-spinal in origin. The membrane-lining is histologically composed of retinal tissue which has been transformed at the ora serrata into a single layer of cylindrical epithelium. In no case has any trace of pigmented epithelium been observed. Bock, of Laibach, ²⁸³ _{Dec. 20, '92} has seen an instance of *congenital oil-cysts* in the region of the lachrymal sacs in a boy 14 years old. Both cysts gave a bluish reflex through the skin. A sound could be readily passed through both lachrymal canals, and the removal of the tumor showed that they were not connected with the sacs. The author reports three other similar cases, and concludes from them, in connection with the study of seven instances previously reported, that these tumors are generally situated between the skin and the anterior wall of the lachrymal sac, usually a little below this latter; so that the greatest part of the cyst is below the ligament of the canthus. Their size ranged from that of a pea to that of an almond, and changed from day to day. The tumors are not readily

movable, as they are usually bound down to the periosteum by connective tissue. Microscopical examination revealed the close identity of this growth with dermoid tumors. Their presence is doubtless due to some foetal defect in the union of the bones of the face. Fromaget, of Bordeaux,^{274 June} reports a case of congenital serous cyst of the orbit, with anophthalmus on the same side and microphthalmus on the other. After careful microscopical study, he concludes that the cyst was not an ocular formation, but that it was due to inclosure of the naso-lachrymal mucous membrane in the orbit. The apparent anophthalmus was produced by the cyst displacing the ball beneath the lower lid.

A case of *hydatid cyst* of the orbit, occurring in a boy aged 13 years, displacing the eyeball down and out, with nearly entire loss of vision, has been reported by Terson, of Toulouse.^{171 Mar.} The treatment consisted in simple puncture and withdrawal of the fluid, complete restoration of vision following. From the impossibility of eliciting fluctuation, the author believes the diagnosis to be often difficult. He advises that puncture should be tried first, then incision, followed by irrigation with distilled water. If the hydatid vesicles fail to be gotten rid of in this way, the author resorts to such radical means as produce suppuration of the sac. He has also employed injections of iodine into the vesicle. Feuer, of Budapest,^{57 Aug. 16} has extirpated a cavernous tumor of the orbit with conservation of the globe.

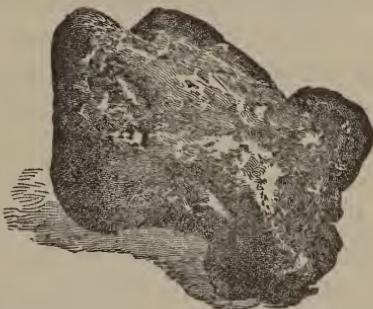
Lemond, of Denver,^{76 Sept.} cites two instances of *exostosis* of the orbit. The first occurred in a man 24 years of age. The growth had appeared in the right orbit eighteen years previously, and two years later the eye had become blind. After enucleation a bony mass was found occluding the optic foramen, and was removed by chiseling. The optic nerve had been entirely destroyed. In the second case, occurring in a man aged 24 years, the tumor had sprung from the floor of the orbit and had pushed the eyeball upward and outward. The eye still retained a visual acuity of $\frac{7}{20}$. Partial removal of the growth was effected, securing relief from the deformity. Lewis, of New York,²⁰⁰⁸ removed a large osteoma from the orbit of a man aged 27 years. The accompanying sketches give an excellent idea of the size of the growth. Bearing upon the cause of the origin of the tumor, it is of interest to note that there had been two injuries inflicted upon the orbital region shortly be-

fore the growth manifested itself. From the displacement of the globe previous to the operation, it was hardly to be expected that the growth had attained as large a size as was revealed by the operative procedure. The tumor was extirpated with conservation of the eyeball. Six weeks later the ophthalmoscope revealed a white atrophy of the optic nerve, which may have been due to traumatism that was attendant upon the operation, or was secondary to a neuritis that existed before the removal of the neoplasm.

Dunn, of Richmond,³⁴⁷ gives the further history of a case of *malignant fibroid* of the orbit, previously reported by him. The growth re-appeared and was eradicated four times in the course of two years, and finally caused the death of the patient from exhaustion. Following the last operation, the tumor increased with great



Anterior view. (Actual size.)



Side of attachment. Posterior view. (Actual size.)

OSTEOMA OF THE ORBIT. (LEWIS.)

Transactions of the New York State Medical Society.

rapidity, projecting over the bridge of the nose so as to partly occlude the other eye and to fill the antrum and nose. The author notes that at the third operation the neoplasm "had chosen as its points of origin all the areas of bone from which the periosteum had been stripped in the former endeavors to eradicate the growth." Microscopic examination showed the tumor to be a "small and large round-cell, giant-celled sarcoma."

A case of *sarcoma* of the orbit extending into the cranial cavity has been seen by Ayres, of Cincinnati,³⁴⁷ June in a man 34 years of age. Early in the course of the disease there was slight exophthalmus and decided blurring of the edges of the disc, with marked reduction of visual acuity. When again seen by the author, eight months later, panophthalmitis had developed, apparently as the result of an unsuccessful attempt at removal of the growth. The

orbit was filled by a hard nodular mass, which slowly increased in size, and was accompanied by intense pain in the occipital region. When seen, three months later, there was paralysis of the right arm, which had existed for two months, and blindness of the left eye, of five weeks' duration, resulting from atrophy of the nerve. Following the line of the coronal suture, and extending into the sagittal suture, there was an elevated and tender ridge on the skull. The right half of the calvarium was tender to pressure. The patient died thirteen months after the time of the first examination. The autopsy showed very intimate adhesion existing between a tumor which pressed forward and separated the third part of the second convolution and the anterior portion of the temporal lobe from the underlying floor of the cranial cavity. The growth extended forward along the optic nerve into the orbital cavity, which it entirely filled with a firm, unyielding mass. The bones composing the orbital cavity were softened, and were covered with a thick tissue resembling granulations. Microscopically, the tumor was a fibroid sarcoma, in which the fibrous elements greatly predominated. The growth contained numerous new, small blood-vessels filled with blood. The tissue of the ocular muscles was invaded by round and spindle-formed cells, whilst the sheath remained comparatively unchanged. Between the bundles of fibre there were more or less regularly-arranged row-like figures of round-cells, with an occasional spindle-shaped one. A case of *symmetrical invasion of both orbits by a probable intra-cranial sarcoma*, in a boy $12\frac{1}{2}$ years of age, is recorded by Alt, of St. Louis.³⁴⁷ Mar. Four months after a fall, which resulted in a fracture of the right temporal bone, a small, round, hard tumor developed behind the trochlea in the right orbit. About six weeks later a solid vascular growth, which crept forward under the conjunctiva, causing the protrusion of the globes, could be seen on both upper and lower *cul-de-sacs*. Previous to the death of the patient, which occurred six weeks later, the growths were said to have protruded from the palpebral fissures.

A successful case of *transplantation of the epidermis*, after the method proposed by Thiersch, has been performed by von Noorden, of Berlin,⁸⁰ Jan. upon a patient in whom he had eviscerated the orbital contents on account of carcinoma. At the end of a year there had been no return of the growth.

W. J. Collins, of London,⁶ Sept. 16 has operated for sarcoma of the

orbit in a man 48 years of age. The growth was composed of two masses, one below and to the inner side of the globe, and a second above and to the inner side, just beneath the orbital margin of the frontal bone. Both masses were semi-elastic and non-fluctuating. The vision of the eye equaled $\frac{6}{12}$. The contents of the orbit and parts of the upper and lower lids were removed, the floor and inner wall were cleaned to the bone, and chloride-of-zinc paste was applied. This procedure led subsequently to the separation of the lachrymal bone and the os planum of the ethmoid. The growth appeared to spring from the region of the lachrymal sac, and proved to be a round-cell sarcoma. White, of Richmond,⁷⁶ Sept. gives the notes of a case of *fibrosarcoma* filling the left orbit, and necessitating the simultaneous enucleation of an eye which still retained vision. At the end of two months there had been no recurrence.

Callan, of New York,²¹³⁹ Jan. has seen nine cases of *orbital traumatism*, resulting in immediate monocular blindness from fracture into the foramen opticum. In one instance the blow was received over the left orbit and caused blindness of the right eye. The author's explanation of the production of the fracture is that the jar made by the blow found its weak point along the line of sutures made by the union of the frontal bone with the nasal, superior maxillary, lachrymal, and ethmoid bones, until it reached the lesser wing of the sphenoid, where it received the first resistance, occasioned by the bifurcation of the suture at this point; the unequalled division of the force which here takes place resulted in fracture of the bone into the foramen opticum, causing compression of the optic nerve and sudden loss of vision in the eye. Roland¹⁷³ Jan. has successfully enucleated the remains of an eye which was found deep in the orbit, entirely behind the capsule of Tenon, which was causing sympathetic irritation in the other eye. The patient had incised the orbit with a goblet eleven years previously in such a way that the globe was freed from all of its attachments save that of the optic nerve. Roose, of Courtray,¹⁷³ June has removed a leaden ball, weighing 32 grammes (about 1 ounce), from the orbit of a man, which had been *in situ* twenty-three years without causing any symptoms.

A case of *exophthalmus*, probably due to idiopathic haemorrhage into the orbit, has been seen by Friedenwald, of Balti-

more, ¹⁰⁷ Mar. in a negro. The condition appeared suddenly, and vision was greatly diminished. Pulmacher, of Posen, ¹⁹⁰ Nov., '92 has successfully ligated the common carotid artery for *arterio-venous aneurism*, due to rupture of the internal carotid artery in the cavernous sinus. The aneurism had caused extensive exophthalmus on the wounded side. Mitvalsky, of Prague, ¹⁹⁰ Jan. has seen an instance of *true blood-cyst* of the orbit, probably traumatic in origin. Microscopic examination showed that the tumor was not dermoid in character, but that it was a true acquired cyst.

Meyer, of Paris, ⁷⁸ Apr. cites an instance of serous tenonitis pro-

duced by a cysticercus in a boy. There was a slight ptosis and almost complete immobility of the affected globe. The iris acted normally. Having ascertained, by the thermometer of Gradenigo, that the temperature of the affected eye was higher than that of the sound one, the author concluded that the cause of the ophthalmoplegia was inflammatory, and accordingly ordered hot applications, which caused a yellowish prominence to appear at the lower border of the cornea. This was in-



FIG. 1.—TUMOR OF THE ORBIT. (VANCE.)

Journal of Arkansas Medical Society.

cised, and a vesicle a little over one centimetre in length was removed, which proved to be a cysticercus of *Taenia solium*. The author inclines to the view that inflammation caused by this animal is dependent upon the irritating chemical action of the substances which it secretes.

A case of *tenonitis* is reported by Burnett, of Washington, ²⁴⁹ Jan. in an apparently healthy girl of 11 years. There was slight swelling and redness of the lid, with chemosis of the conjunctiva and proptosis, the eyeball being fixed and pushed directly forward. There was marked serous retinitis, but no haemorrhages. A

puncture made through the lid into the orbit was followed by the escape of bloody serum. The patient made a good recovery.

In a case of *contracted socket* resulting from the formation of a cicatrix extending as an inclined plane from behind forward to the edge of the lower lid, with a similar cicatrix involving the nasal half of the upper conjunctiva, Maxwell, of Dublin,⁷⁶ July performed the following operation: Two incisions were made, one parallel with and five millimetres below the edge of the lower lid, and a second, more curved, below. This left a piece of skin which was dissected up, forming a ridge. After undermining the skin of the cheek below, a double-armed suture was passed through the bridge at two points and brought out in a similar manner through the skin of the cheek. The first incision was now deepened and made to communicate with an incision previously made in the floor of the socket. The bridge was now

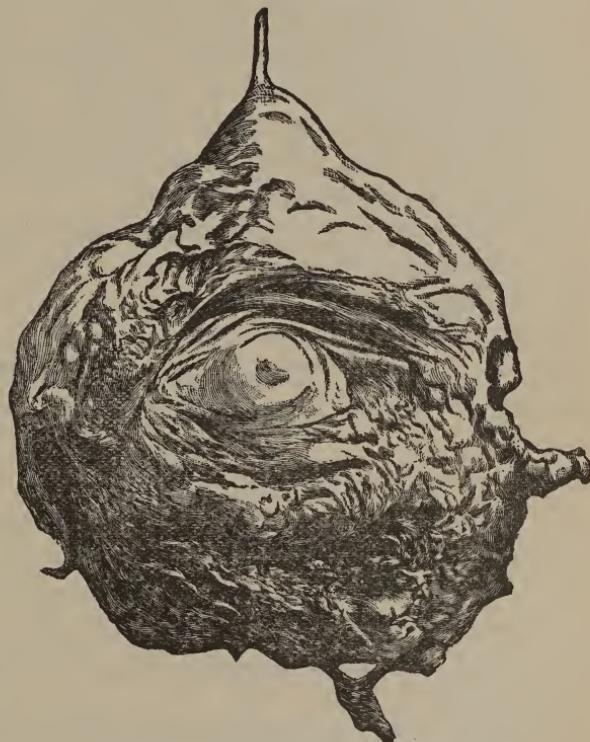


FIG. 2.—TUMOR OF THE ORBIT. (VANCE.)
Journal of Arkansas Medical Society.

drawn up under the lower lid, its upper edge sutured to the posterior lip, and its lower edge to the anterior lip of the incision in the socket. The edges of the denuded area in the cheek were drawn together by sutures, when the ends of the first suture were drawn upon until a good fornix was obtained, and then tied loosely over a piece of drainage-tube. A similar operation, somewhat modified, was performed upon the upper lid. The author has employed the same means for correction of symblepharon.

A tumor of the orbit that occurred in a girl, 19 years old, seen by Vance, of Harrison, Ark., ^{May 15}⁵⁰⁶ first made its appearance nine years before, causing pain in the eye, which was soon followed by exophthalmus. It is shown in Fig. 1, on page B-32. Fig. 2 (B-33) shows the appearance of the growth after its removal. At this time it was adherent to the bony frame-work of the orbit. It was readily extirpated.

DISEASES OF THE LACHRYMAL APPARATUS.

In order to obtain a proper diagnosis of the location, length, calibre, and character of an *obstruction* in the lachrymal canal, Caldwell, of New York, ^{Sept. 2}⁵⁹ has devised a probe (see sketch) armed at each end with a bullet-shaped tip, one centimetre long, having a conical point and abrupt shoulders.

Gradle, of Chicago, ⁷⁶_{May}, distinguishes two classes of disease of



LACHRYMAL PROBE. (CALDWELL.)
Medical Record.

the lachrymal passages: those in which the tear-gland is called into special activity by an occasional stimulus, and those in which the weeping is continuous. He considers the prognosis invariably worse in the latter class. In cases of stricture, in which the probe can be entered without undue force, he recommends electrolysis of the duct.

Cheatham, of Louisville, ²²⁴_{Apr. 27} emphasizes the importance of examining the nasal passages after the passing of lachrymal probes, both in order to determine their position and to detect the presence of any abnormality which might tend to obstruct the lower end of the ducts. Believing that cases of epiphora are often caused by some defect in the natural aspiration of tears, Galezowski, of Paris, ¹⁷³_{June} has proposed a new operation in the treatment of this class of cases. He incises the lower canaliculus along its floor for two millimetres, and passes an olivary sound, No. 3 or 4, into the nasal duct, and leaves it in position about ten minutes. He says that three or four days of this treatment,

combined with the use of boracic-acid wash and boracic-acid and cocaine ointment, suffice to complete the cure.

Peters, of Bonn, ³⁵³ Nov., '92 supports his position in regard to the treatment of cases of atresia of the lachrymal duct in infants by citing a number of instances cured by simply pressing out the contents of the sac and waiting for the absorption of the membranes. Where this procedure does not succeed, he has found one introduction of the sound sufficient. Wood, of Chicago, ⁷⁶ Sept. determines the extent of the obstruction by noting the permeability of the duct when water is injected through the canaliculus. For this purpose he employs an irrigator consisting of a reservoir elevated about ten feet above the patient, and connected by a flexible tube with the ordinary tip of the lachrymal syringe.

In the treatment of stricture of the nasal duct, Theobald, of Baltimore, ³⁹ May employs probes of large size. He begins the dilatation, where possible, with a No. 5 or 6, and gradually increases the size until a No. 16 can be passed. He states that the only objection to this plan is that the duct may remain too pervious and permit of the passage of air when the "nose is blown." Jarrett, of Fort Scott, ⁴³⁰ July prefers Theobald's method of treating lachrymal obstruction.

In order to ascertain, to a certain extent, the conformation of the lachrymal canal, and so furnish an index as to the proper curve to be given to the style, Thomas, of Philadelphia, ⁸⁰ Aug. 15 has devised a series of flexible leaden probes provided with conical tips.

Baptie, of Ottawa, ¹³⁰ Oct., '92 has seen sloughing of the upper lid, iritis, and optic atrophy, associated with a large slough of the mucous membrane of the nose, in a man 64 years of age, supervening upon the employment of intra-nasal injections, presumably for the destruction of polypi.

Galezowski, of Paris, ¹⁷³ Oct., '92 cautions against the diagnosis of *dislocated lachrymal glands*, in elderly, obese persons, as tumors. In acute inflammation of the gland, the author has had satisfactory results from the use of quinine, leeches, and mercurial inunctions to the brow, whilst he has best combated chronic inflammation by pressure and the local application of iodine. Rockliffe, of Hull, ² Dec. 17, '92 has seen *panophthalmitis* follow lachrymal abscess, in a patient aged 63 years, who had had lachrymal obstruction for three years.

Mazet, of Bordeaux, ¹⁸⁸ June 4 reports a case of *lachrymal tumor*

where bacteriological examination revealed the presence of a colony of streptococci. A portion of this culture injected into the eye of an animal produced a violent purulent conjunctivitis. Sanford, of Cork,^{2 Mar. 18} has removed both lachrymal glands, which were so greatly *hypertrophied* that the right eyelid was completely closed and the left partially so. There was some enlargement of the cervical lymphatics and of the lymphoid tissue of the pharynx. The growths proved to be adenomatous in type. There had been no recurrence after an interval of two years.

Terson, of Paris,^{274 Jan.} believes that ablation of the lachrymal glands to relieve epiphora is entirely justifiable, as enough tears are furnished by the acinous glands of the conjunctiva and of the tarsus. DeWecker's procedure should be the operation of choice, as it will relieve a number of cases in which other therapeutic measures have failed.

In regard to the indications for removal of the lachrymal glands, Truc, of Montpellier,^{274 May} concludes as follows:—

The removal of the lachrymal gland is a procedure demanding consideration in the treatment of simple or complicated epiphora, and of those instances which resist ordinary means. It is an operation which should be held in reserve and as a last resource. Palpebral removal is an operation of choice, suitable for simple and for the majority of complicated cases; whereas orbital removal is an operation of necessity, applicable to complicated cases of extensive conjunctival disease and certain cases of serious blepharitis with hypertrophy of the mucous membrane and marked ectropium.

DISEASES OF THE EXTRA-OCULAR MUSCLES.

The method of *rhythmical exercise* advocated by Savage, of Nashville,^{1007 May} for developing the ocular muscles, is based upon the principle that "contraction and relaxation, alternating in sharp and rhythmical order and continued short of fatigue, is the kind of exercise that *develops* a muscle in any part of the body." In exophoria one of two plans may be adopted: In the first a lighted taper is held at arm's length in front of the face, on a plane with the eyes, and, while being fixed, is gradually brought into within four inches of the face, where it is held for two seconds, when the eyes are closed for a moment and then re-opened, and made to fix

a taper placed at a distance of twenty feet. This procedure is to be repeated six to ten times at one sitting every day. The second plan, and the one which answers for insufficiency of other straight muscles, consists in viewing a distant object for five seconds through weak prisms, placed with their apices in the direction of the muscle to be developed, after which the lenses are raised and the muscles allowed to relax for the same length of time. This is to be repeated two to five times a day, each sitting lasting from two to five minutes. The author states that success attends this plan of treatment only in insufficiencies of low degree. Wakefield, of Salem, N. C.,¹⁰⁰⁷ July reports several cases of heterophoria which were benefited by rhythmical exercise of the affected muscles. French, of Springfield, Ill.,¹⁰¹⁸ July has found that, when any degree of heterophoria persists in a case that has for months resisted all other treatment, including the development of the muscles by prism-practice, a carefully-graded tenotomy will usually yield most gratifying results, and is frequently the only means of cure.

A case of simultaneous and symmetrical tumors of the lachrymal and parotid glands is reported by Snell, of Sheffield.⁶ July 1 Examination showed, in both orbits, a lobulated growth occupying the position of the lachrymal glands. The tumor produced noticeable swellings on the eyelids and were visible under the conjunctiva. Both parotid glands were swollen, and the submaxillary and sublingual glands were full. Previous to the death of the patient, which occurred five years later, the orbital growths were said to have greatly increased in size; that of the left side reaching to the temple and face, and being of a bluish color. The right parotid gland ulcerated through the cheek.

Meany, of Washington, D. C.,⁵⁶ Mar. has successfully employed skin-grafts in operating for fistula of the lachrymal sac. Baptie, of Ottawa,¹³⁰ Oct. has removed a *rhinolith* weighing more than 121 grains (7.25 grammes) from the left nasal passage of a woman 70 years of age. Three years previously, during the course of a purulent discharge from the nasal side of the left orbit, the eye upon this side had been destroyed.

Percival, of Newcastle-on-Tyne,⁷⁶ Nov., '92 states that, for patients who cannot adapt themselves to the profound alteration in the activity of the nervous centres for convergence and accommodation produced by the correction of refraction errors of high degree,

relief can be given by weak prisms, the relative convergence being the basis on which to found the principle of treatment; he further states that practically we need only concern ourselves with that which has to do with the vision of objects at and beyond the distance of one-third of a metre.

Jackson, of Philadelphia,⁷⁶ has modified the rotary prism by so arranging the lenses that the two rotary prisms in their primary position act together, and in this position are neutralized by a fixed prism of double their strength. As an equivalent to the prism, he



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employs a glass rod ground with its flat side inclined to the cylindrical surface so that it exerts a prismatic action in the direction of its length. The advantage of this arrangement is that, in turning the prisms from their primary position, the effect progressively increases until the rotation amounts to ninety degrees.

The accompanying cuts well illustrate the case of right ptosis published by Hubbell, of Buffalo,²⁴⁹ v. 23, No. 1 which was temporarily relieved during synchronous movements of the lower jaw. In lieu of want of autopsy in such cases, the author explains his own

case by the following supposition: "The origin of the fibres supplying the levator muscle has been transferred from the nucleus of the fifth, which sends fibres to the anterior belly of the digastric muscle. The nucleus of the third nerve seems to be undeveloped in that portion from which arise the fibres supplying the levator of the upper lid, the superior rectus, and the internal rectus (possibly the inferior oblique), and the iris is normally present."

Nuel, of Liège,²⁷⁴ has seen a very remarkable case of *hyaline degeneration of the external ocular muscles*. The form of the



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paralysis was such that a nuclear lesion was suggested, and the symptoms produced by the condition simulated those caused by an intra-cranial tumor. The degeneration occurred in a perfectly healthy man, the only possible cause in the production of the disorder being an electric shock to which the patient had been subjected ten years previously. The right eye was entirely immobile, and exhibited a slight degree of exophthalmus. Below, to the temporal side, covered by the conjunctiva, there was a tumor with a bossellated surface. A second analogous growth was situated

above, to the nasal side. The left eye could not be abducted, whilst its other movements were normal. On account of the absence of cerebral symptoms, conjoined with the presence of the tumors, and the fact that the ophthalmus was daily increasing, it was deemed advisable to operate upon the contents of the right orbit. The growth was found to consist of a number of very friable hernias. Examination showed that the condition had been caused by a degeneration of the ocular muscles, accompanied by a considerable increase in size and length, as well as in diameter. The wound healed by first intention, and vision, which had been $\frac{5}{9}$ before the operation, was increased to $\frac{6}{9}$. In spite of the good visual acuity and the immobility of the eyes, there was no diplopia. Microscopical examination showed that not only the contractile fibres, but also the interstitial connective tissue and the vessels of the muscles, were much changed. Atrophic degeneration predominated in the contractile substance. The author states that the increase in volume in the muscles was caused by an hyperplasia of the connective tissue, due to a degeneration similar to the hyaline variety described by Recklinghausen. The sarcolemma seemed to be affected by the same process. The walls of the vessels, especially those of the arteries, were found to be involved in every instance. He advances the opinion that it is possible that the electric shock to which the patient had been exposed had modified the contractile substance and that the alteration (chemical) of the contractile substance had given rise to an irritation which had produced the degeneration.

Mansfield, of Baltimore,^{1018 Jan.} is of the opinion that the maintenance of binocular vision in cases of *anisometropia* should be effected by obtaining muscular equilibrium, either by the wearing of prisms or by tenotomy. In those cases of monocular aphakia in which the fellow-eye has useful vision, binocular vision can be maintained by the wearing of glasses which accurately correct the refraction error for each eye; a second pair becoming necessary for near work, to supply the lost accommodation. In these cases the maintenance of unison between the two eyes depends more upon the production of retinal images of equal size in the two organs than upon muscular balance and equilibrium.

In several cases of *lateral heterophoria*, Theobald, of Baltimore,^{76 Sept.} has found the vertical diplopia-test to be untrustworthy.

Murrell, of St. Louis, ⁷⁶ considers that the physiological limits of the amount of heterophoria are quite variable, and that great variability of the lateral balance may be connected with hyperphoria, or may be independent of it, or that the latter condition may be secondary to the former. In ordering prisms, no rule can be adopted as to the proportion of the anomaly to be corrected; in individual cases this must be largely a matter of experiment. In *hyperphoria* of more than one degree, Wilson, of Detroit, ¹⁰¹⁸ July performs tenotomy, while in many cases of heterophoria he believes it to be unnecessary, as the muscle-balance, when but slightly deranged, can often be restored by exercising the affected muscles with prisms.

From his experience in the treatment of *latent deviations of the visual axes*, Marlow, of Syracuse, ¹ Apr. 15 concludes: "1. That the kind of deviation has very rarely any relation to the kind of refractive error. 2. That heterophoria is only exceptionally influenced by the correction of the refractive error. 3. That, in many cases, the symptoms can be relieved by prisms alone, or in combination with the refractive correction. 4. That, in some cases of undoubted heterophoria, prisms are rejected altogether, and that in some of these cases correction by tenotomy or tenotomies gives the desired relief. 5. That the position of rest can be changed by a strictly *partial tenotomy*. 6. That the ophthalmologist who ignores the condition of muscular equilibrium in a case of asthenopia (in the widest sense of the term) does not do his whole duty to his patient."

In a case of *exophoria* of 4 degrees for distance and 13 degrees to 14 degrees for near, Peete, of Macon, ¹⁰⁰⁷ June succeeded in relieving the reflex symptoms, consisting of severe ocular pain, headache, and itching, drawing and burning sensation at the vertex of the head, by the combined effect of double partial tenotomy with "rhythmic exercise." In a series of cases of marked heterophoria in which eccentric poses of the head were assumed in order to maintain binocular vision, Colburn, of Chicago, ⁷⁶ Sept. has succeeded in obtaining normal position of the eyes and of the head by performing tenotomy upon the affected ocular muscles. Bates, of Hamilton, Ont., ¹⁰¹⁸ Jan. claims to have had excellent results in the treatment of insufficiency of the recti interni by the systematic exercise of the muscles with abducting prisms.

Maddox, of Edinburgh, ⁷⁶ Feb. recommends the following *maxims in ordering prisms*: “ 1. Never order them unless the indications for their use are unmistakable. 2. Never order them simply on account of an anomaly in the behavior of the eyes under the various tests, unless there is asthenopia, headache, tendency to diplopia, or giddiness, possibly relieved by them. 3. Do not judge by one test, but by the ‘finger-,’ ‘rod-,’ and ‘card-’ tests, and, if specially indicated, the ‘relative-convergence’ test also. 4. Remember that considerable latent deviation in distant vision is more important than in near vision (though the latter is not to be ignored), and that moderate divergence in near vision is physiological. 5. Always more or less under-correct with prisms.”

Tscherning, of Paris, ¹⁷¹ Jan. thinks that the theory of *strabismus* proposed by Hansen-Grut offers the most satisfactory explanation of the majority of the facts known in regard to this condition, as it does not require the belief of the hypothesis of changes in the muscle, which have never been proven. In the treatment of strabismus, Parinaud, of Paris, ¹⁷³ May considers, first, the unoperative or dioptrical method; second, the operative. In convergent strabismus in young children, atropine alone is used. When glasses are ordered, the full correction is to be worn constantly. In divergent strabismus complicating myopia, concave glasses are of value by diminishing excessive convergence for distant fixation. Prisms facilitate binocular vision and aid the regular development of the innervation of convergence, and, when worn with their bases in, are often of service, in combination with concave glasses, in beginning divergent strabismus. They are also of value, in some cases of convergent strabismus, when placed with their bases out, thus displacing the image on the retina. The author points out that mere division of a muscle will accomplish nothing, but that the contraction of the fibrous insertion of the muscle must be severed before any appreciable result can be obtained.

In the past ten years, de Wecker, of Paris, ²⁷⁴ Jan. has performed the operation for the cure of strabismus two thousand three hundred and six times. In thirteen hundred and eighty-one of the cases, he made use of his capsular advancement operation, the advancement of the muscle being performed but twenty-five times, the author claiming that the movements of the eye are regulated by its capsule. The operation is almost painless, is not disfiguring,

and its effects can be carefully graded. He usually associates it with tenotomy of its antagonistic muscle.

The following description of an operation for moderate degrees of strabismus is described by Wherry, of Cambridge^{June 10}: A small incision is made into the conjunctiva at the lower border of the tendon, through which a strabismus-hook armed with a long horse-hair is passed behind the tendon and brought out through a similar opening made at its upper border. An unarmed hook is now passed from below upward between the conjunctiva and muscle, again threaded with the suture left at the upper opening, and withdrawn. After the fascia and the tendon have been dissected from the globe, the encircled tendon is then drawn gently downward and divided, whilst all the included tissues are cut, until the suture can be pulled through. Ayres, of Cincinnati,^{347 Nov., '92} reports the successful treatment of a case of convergent strabismus, in a child 2 years of age, by the wearing of glasses which corrected the refraction anomaly. Bourgeois, of Rheims,^{173 Apr.} has operated upon twenty-eight cases of strabismus by various procedures. In the majority of instances the operations were performed on the same eye, or on both eyes at intervals of several days. In order to avoid an over-correction the author makes use of a partial tenotomy, employing double and simple tenotomy and muscular advancement. The operative method is preferable to any other, is almost painless under cocaine, and is almost always successful. The correction of ametropia by glasses and stereoscopic exercises, while quite useless without operative procedure, is of great value after an operation has been performed. Operative procedure should be inaugurated between the sixth and the eighth years.

Lagleyze, of Buenos Ayres,^{274 Nov., '92} has introduced a new operation in the treatment of strabismus, the action of which depends upon a shortening of the muscle itself. A fold of conjunctiva is incised about three millimetres from the cornea, and the tissues are dissected away until the muscle is exposed. Two strabismus-hooks are now inserted under the muscle,—one near its point of attachment, the other as far back as the dissection of the tissues will permit. A thread, provided with curved needles at each end, is made to envelop the muscle by passing the superior needle through the muscle from within outward, about one millimetre

from its superior border. This suture is brought out through the conjunctiva. The other needle follows a similar course, except that it is made to pass through the corresponding parts inferiorly. The two needles are now passed under the conjunctiva and brought out near the superior and inferior portions of the cornea, respectively. Traction is made upon the end of the suture, and the effect of the shortening is noted before the knot is tied. A monocular bandage is applied for several days. At the end of twelve days after the operation, the suture is removed. The author states that it is impossible to know in advance how much of the muscle should be included in the suture, but he believes it to be the



DEVIATION OF EYES IN ALTERNATING SUPERIOR STRABISMUS. (VAN MILLIGEN.)
Centralblatt für Praktische Augenheilkunde.

operation best adapted to obtain precise results in this class of cases.

Van Milligen, of Constantinople,^{190 Nov., '92} has cured a case of alternating superior strabismus by operative procedure. Before the operation, when the patient fixed with the left eye, the right one looked down, and was partially covered by the upper lid; when he fixed with his right eye, however, the left eye turned up and out. The right-sided ptosis disappeared after the visual axes became straight. The accompanying cuts illustrate these deviations.

Thompson, of Kansas City,^{76 Sept.} considers the operation for convergent strabismus, when judged by the final result, as one of the

most difficult, uncertain, and unsatisfactory in ophthalmic surgery. The principal cause of the difficulty experienced in its correction is that all the rotary muscles of the eye are concerned in the causation of the squint; they and their connected fascia having acquired altered relations with the eyeball, which are not re-adjusted by a simple tenotomy. In operating, he favors performing a capsular advancement upon one or both eyes, with or without tenotomy. Lewuillon, of Mons,^{171 Jan.} believes that the amblyopia occurring in cases of convergent strabismus is secondary and not primary to the deviation. The correction of the amblyopia is of the greatest importance; and when ocular exercises are insufficient, injections of strychnia and the local application of electricity are of great value. Strabotomy is only of value from an æsthetic stand-point, and is quite inferior to the restitution of binocular vision.

Bernstein, of Baltimore, ^{1 Apr. 22} records a number of cases of strabismus to show the marked beneficial influence exerted upon the squint and the attendant amblyopia by wearing the proper correcting lens and by systematic exercise of the squinting eye. In a case of convergent strabismus in which, owing to an injury, the fixing eye had to be enucleated, Johnson, of Paterson, N. J., ^{76 Sept.} has seen the visual acuity of the remaining eye increase from counting fingers at six inches to $\frac{2}{5}^0$ in three weeks' time.

In order to avoid the tendency to divergence which usually exists after tenotomy for internal strabismus, Ayres, of Cincinnati, ^{347 Mar.} is of the opinion that, except in a very high degree of squint in children, it is better to correct the refraction error and allow the glasses to be worn for a period of from one to four years before performing any operation. From an experience based upon operations performed upon twenty-five patients for divergent strabismus, Pomeroy, of New York, ^{1 Mar. 11} concludes that nearly all cases of this disorder may be corrected without advancement. The best method is to divide one or both externi, and then secure a convergence of from one to four lines by suturing the globes to the inner canthus. Fabre ^{230 June} makes use of capsular advancement, as proposed by de Wecker, when simple tenotomy is insufficient. He lays particular stress upon the importance of the patients wearing the full correction in both eyes after operation. In cases of divergent strabismus, after tenotomy of the rectus externus, the author employs Knapp's suture in order to augment the effect of the operation.

Mueller³⁵³ has studied microscopically bits of muscle-tissue taken from antagonistic muscles, comparing them with normal muscle-fibre. In the antagonists the clear fibres appeared in relatively greater numbers than is normally the case. In transverse section there was a large number of nuclei in the central muscle-cells. The finely-striated appearance of muscle-tissue in the former condition had disappeared, although evidences of fatty and connective-tissue degeneration were not evident. To avoid the difficulties caused by spasm of the muscles in operations for strabismus, the patient is placed under a general anaesthetic. The muscle is exposed, and the length to be excised is carefully measured with a pair of compasses. He then leaves a bit of muscle, from one to two millimetres long, attached to the sclera. After the muscle has been secured by sutures, it is cut through and its two ends are sutured. These sutures are allowed to ulcerate their way out. Both eyes are bandaged for three days, and the sound one is then half-covered with a piece of plaster, in such a manner that the patient can only see on that side on which the muscle has been sutured. In divergent strabismus, the author has found that it is necessary to excise a correspondingly-sized piece of muscle when the degree of deviation amounts to six millimetres. When the divergence is more than that, he removes a piece one to two millimetres greater than that of the deviation, whilst in convergent strabismus he excises a piece one millimetre shorter.

Baker, of Cleveland,⁷⁶ reports a case of persistent spasm of accommodation not permanently benefited by lenses or by the employment of a mydriatic, but temporarily relieved by tenotomy of the external rectus. He is skeptical as to the benefit of a tenotomy in any case in which prisms or the closing of one eye does not give, at least, partial relief. In the treatment of cases of asthenopia his order of procedure is to first correct the error of refraction, and, if this fail to give entire relief, to resort to prisms and systematic exercise of the muscles. Where this plan results in no perceptible improvement, the condition is the local expression of a general neurosis that is often not amenable to ocular treatment.

Nieden, of Bochum,¹⁹⁰ has seen a case of *functional torticollis* cured by the correction of a paralysis of the superior rectus muscle of the left eye. The patient, a boy 11 years old, had been holding

his head obliquely to the right since the age of 5 years, at which age he had had convulsions; the false position of the head was increased by near work with the eyes. Examination showed a deviation of the left eye down, which was corrected by an advancement of the superior rectus and a tenotomy of the inferior rectus of the affected eye. The wryneck disappeared shortly after the visual axes became straight. Graefe, of Halle,¹⁹⁰ Dec., '92 points out that paralysis of the superior rectus would cause the head to be thrown backward and not downward, as in Nieden's case, and suggests that the lesion must have been a paralysis of the trochlearis of the other eye.

Landolt, of Paris,²⁷⁴ May describes a typical case of *partial paralysis of the left external rectus*. The right eye could make a normal excursion in both directions, whilst the left eye stopped at twenty-two degrees in its outward excursion, showing that the latter eye could make a total movement of but 70 degrees as compared with the normal one of the right eye of 96 degrees. The right eye alone could fix between 22 degrees and 48 degrees on the left. Harmonious true binocular vision was only possible over an area of 15 degrees,—*i.e.*, from 48 degrees on the right to 33 degrees on the same side. Diplopia existed elsewhere. This inco-ordination, he believes, is due to the fact that it requires a stronger stimulus to produce the same amount of activity in the paralyzed eye than it would in the sound eye, and, as a result, there is an unequal contraction in the two muscles. The error in projection of the image was about 4 degrees, and the secondary deviation exceeded the primary by 4 degrees. This correspondence is accounted for by the fact that the excess of energy which is needed by the left eye reveals itself in this eye by a false projection and in the other by an excess of movement.

In discussing the subject of "eye-paralyses," J. A. Jeffries, of Boston,⁹⁹ Oct. 20, '92 summarizes as follows: "1. All cases of lateral conjugate paralysis are of central origin. 2. When the paralysis is on the same side as other paralyses, the lesion is on the opposite side of the brain. Such paralyses, as a rule, are transitory, and follow almost any sudden lesion, and often only show themselves as a prevailing position of the eye, and not as a true paralysis or even paresis. 3. When the paralysis is crossed with the paralysis below, the lesion is in the pons-medulla region. The

foregoing three are equally true of spasms. 4. A gradual development of conjugate paralysis clearly points to the region of the sixth nucleus of the same side as affected. 5. Paralysis of up or down motions, or both motions, indicates disease in the region of the corpora quadrigemina, but may be due to disease in the third nerves proper, at the point of exit. 6. Reasoning from analogy, paralysis of convergence points to disease in the central gray substance below the aqueduct, but as yet autopsies are lacking. 7. Picked paralysis of parts of a third nerve strongly suggests central disease, but is not proof of it. 8. A majority of the cases of eye-paralysis occur in the syphilitic. 9. A paralysis which changes rapidly, quickly showing fatigue, is probably central in origin. 10. Transitory paralysis in the syphilitic is strongly suggestive of future tabes. 11. An eye-paralysis, however simple it may seem, is always a just cause for suspicion of trouble to come, and demands a prompt and thorough examination of the patient. 12. There is no evidence of any form of connection between the sixth nucleus and the third, except in the cerebrum."

A case of complete paralysis of the internus and externus of each eye has been observed by Hotz, of Chicago,^{249 Jan.} in a man aged 22 years. The optic axis of the left eye was directed forward, but that of the right eye converged ten degrees. There was homonymous diplopia in the median line and toward the left, but no diplopia toward the right. One week later, left-sided facial paralysis, with paralysis of both arms and legs, appeared, and continued for two weeks, when improvement began and went on to complete recovery.

DISEASES OF THE LIDS.

Gallaemaerts, of Brussels,^{868 Aug. 5} records an instance of *pediculus pubis* occurring in a young child. The parasites had previously been found on the head and chest. De Schweinitz, of Philadelphia,^{1018 Apr.} removed a *cutaneous horn*, twelve millimetres in length and four millimetres in thickness, from the ciliary border of the upper lid, in a man 40 years of age.

Parisotti, of Rome,^{78 May} reports the results of eighteen observations, showing that the tissue proper of *chalazion* is similar to that of a tubercular globule. Deyl, of Prague,^{57 Apr. 2} believes a specific bacillus causes the disease, which is probably identical with the

pseudo-diphtheria bacillus of Loeffler. A scrofulous diathesis is also an attendant factor.

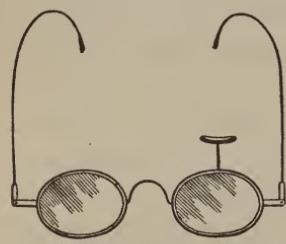
In a case of *meibomian cyst* of large size in the upper lid, Gould, of Philadelphia,^{9 June 8} noted a temporary change in the axis of astigmatism which reverted to the original angle after the extirpation of the tumor. A case of *gumma of the eyelid* is reported by Barck, of St. Louis.^{347 June 15} Examination showed a large tumor of the upper lid which was undergoing ulceration upon the conjunctival surface. Notwithstanding the administration of large doses of potassium iodide, the growth invaded the free margin of the lid, and was only arrested after the use of hypodermatic injections of bicyanide of mercury. Silex, of Berlin,^{4 Feb. 27} has seen an instance of a gummatous swelling of the upper lid in a man, 40 years old, who exhibited the remains of an apoplexy resulting from specific disease of the vessels. There was a gumma on the nose. Fisher, of Chicago, cites a case of gumma of the upper eyelid in a girl of 16 years of age, who was under treatment for interstitial keratitis. The growth, which resembled a dislocated lachrymal gland, was freely movable and could apparently be forced into the lachrymal fossa, from which position it was extruded upon forcible closure of the lid. The mass disappeared under the administration of the iodide of potassium.

Gruening, of New York,^{76 Sept.} gives the notes of a case of *sarcoma* of the lid in a man 23 years of age. The growth had primarily appeared five years previously, and had been removed two years later, but had recurred. Examination showed a smooth, firm, globular tumor the size of a hazel-nut, involving the outer two-thirds of the right lower lid. Upon the conjunctival surface of the lid there were soft nodular masses which were readily excited to bleeding. The affected portion of the lid was removed, and replaced by a flap secured from the temple. The growth proved to be a spindle-cell sarcoma of fascicular structure, almost completely inclosed in a connective-tissue capsule. Armaignac, of Bordeaux,^{188 Dec. 11, '92} has cured an obstinate case of *ulcer* of the lid, which presented an unusual appearance, by the application of tincture of iodine and an ointment of aristol.

In the treatment of *palpebral eczema*, Troussseau, of Paris,^{173 May} employs antiseptics in the day-time, and applies a poultice of rice-meal at night. If there be free oozing, a powder consisting of

bismuth, oxide of zinc, and boracic acid is applied to the inflamed surface. Ointments should be used only in the last stages, when slight desquamation sets in. He prefers white vaselin, fresh lard, bismuth, oxide of zinc, ichthyol, yellow oxide, and oil of cade. He believes that the disease is of a parasitic origin, and that the antiseptic treatment is of greatest importance. He thinks that any antiseptic will succeed as well when used in the same strength as corrosive sublimate, but he prefers one less irritating than the latter.

Despaguet, of Paris, ¹⁷³ Nov., 1892 reports a case of obstinate *blepharitis* cured by bichloride of mercury in strong solution. He first assures himself that the lachrymal ducts are patulous, and then applies, on alternate days, a solution of the bichloride of mercury in glycerin, of 1 to 100 and 1 to 30; the second solution should be used by no one except the physician. Any excess should be washed from the conjunctival sac by cold water.



PTOSIS FRAMES. (TURNER.)
British Medical Journal.

By means of the device shown in the annexed cut, Turner, of Grimsby, ² Aug., 1895 was able to overcome a degree of *ptosis* in a patient who refused operative treatment. A concave crutch of thin wire was projected backward from the upper rim of a

pair of spectacles and served to raise the ciliary border by pressing back the upper part of the lid above the ball.

In operations for the cure of ptosis, Masselon, of Paris, ²⁷⁴ July uses a double needle-thread. One or more sutures are entered four millimetres above the free edge of the lid, four millimetres apart, and are brought out at a point above the eyebrow, fibres of the frontalis muscle being included in the sutures. The ends of the thread are then tied over a bit of drainage-tube, and the sutures are left to cut their way out. When for any reason operation is contra-indicated, the author employs a small wire speculum attached to the upper rim of a spectacle-frame, which raises the lid from the pupil by pressing the fold between the lids and the brow.

In a case of congenital ptosis associated with a strikingly-restricted motion of the eyes in the four cardinal directions, Bach, of Würzburg, ⁶⁸ Feb., is inclined to think that the causal element was some morphological abnormality, the bones of the face being much under-developed. Jocqs, of Paris, ¹⁷¹ Mar. has operated upon a case of

unilateral congenital ptosis by removing a portion of the tarsal tissue, as proposed by Gillet de Grandmont. Two weeks later the lid was elevated by a combination of the operation suggested by de Wecker and Panas. His entire aim is to raise the lid by inserting the raw edge of the inferior lip of the wound underneath that of the upper, and finally to unite the lid to the frontalis muscle by means of the subcutaneous superficial tissue. Three cases of congenital ptosis of the left upper eyelid, in which the lid could not be voluntarily raised, but moved upward freely when certain of the masticatory muscles were being used, have been observed by Sinclair, of Birmingham.⁷⁶

The accompanying illustrations represent a case of *extensive*



RESTORATION OF EYELID AFTER SEVERE BURN. (WEEKS.)

New York Eye and Ear Infirmary Reports.

burn of the face, in which Weeks, of New York,^{2139 Jan.} has restored the eyelids after the flap method recommended by Wolfe. The author has tabulated twenty-seven cases operated upon by this plan, and concludes as follows: "1. The transplantation of a flap without a pedicle is not so certain to be successful as the transplantation of a flap with a pedicle. The former should be done only when the latter is not possible. 2. The flap should be free from subcutaneous tissue, and should be kept at the temperature of the body, as nearly as possible, during the process of removal. It should be placed in position as quickly as possible. 3. Strict antisepsis or asepsis should be employed throughout the entire procedure. 4. No sutures should be employed for securing the flap if they can be dispensed with. They add an element of danger. 5. The flap may be inspected with safety after forty-eight

hours. If there is no contra-indication, it should not be disturbed for four or five days. 6. The attachment to the cheek or of the margins of the lids to each other should not be severed until the flap has become firm."

St. John, of Hartford, ^{July 29} describes a method of operating for the restoration of the upper lid by a flap taken from the cheek. An incision, commencing about one-half inch in front of the ear, is carried forward half an inch below the lower lid to the side of the nose, continued downward until the flap is of sufficient width, when it is carried backward. The flap is then dissected and secured by numerous stitches to the freshened surface above. The gap left by the removal of the flap is closed by separating the tissues of the cheek below the wound and sliding them upward. Price, of Nashville, ^{Jan. 1007} has modified the operation of Burow for the cure of *trichiasis and entropium*. After the ordinary incision is made, combined with cross-cuts, as advised by Savage, a strip of rubber adhesive plaster, one-half inch wide and of the length of the lid, is applied close to the muco-cutaneous margin of the roots of all the involved lashes. The upper free edge of the plaster is attached high up on the skin of the lid, thus inverting its margin. The plaster is allowed to remain for a few days until the gaping incision in the conjunctival surface of the lid is filled with organized tissue.

Masselon, of Paris, ^{July 171} has proposed a new operation for entropium of the upper lid following granular conjunctivitis, by incising the skin parallel to the free border of the lid. The skin-flaps are loosened; the cartilage is cleansed of muscle-fibres, and is trimmed with scissors to a thinness that is compatible with flexibility. Three vertical sutures are then imbedded in the tarsus, which serve to evert the border of the lid by changing the curve of the cartilage. No cutaneous sutures are used. In a case of *eversion of the upper eyelid* resulting from abscess, Snell, of Sheffield, ^{July 12} operated successfully by liberating the lid from its cicatricial attachments and uniting the free borders of the lid during the progress of granulation. Skin-grafts were employed, but were of doubtful value, as no islets of new growth were ever detected.

Bourgeois, of Rheims, ^{Mar. 173} has made use of the cutaneous flap in a case of cicatricial ectropium and in an instance of ectropium following a burn where the eye was quite exposed, with satisfactory

results in both instances. He states that when it is necessary to restore the upper lid the eyebrows should be shaved. One of the ends of a band of tarlatan is fastened above the superciliary region with collodion, the other being attached to a dressing back of the head after the operation is over. This band serves to keep the tissue tense at the time of grafting, and holds the flap in position. Blepharorrhaphy is now done, and the wound is prepared by giving it an oval or elliptical form. The author recommends that a pattern the size of the graft that is required be cut and laid upon the skin of the forearm, and a correspondingly-sized piece be excised. Only the true skin should be taken, and it should be instantly placed upon the raw surface that has been prepared for it. The operation lasts about two hours. The first dressing is allowed to remain for five days, and the stitches of the flap are left in place for eight or nine days.

Rogman, of Gand,²⁷⁴ Oct., '92 has modified Harlan's operation for the cure of *symblepharon* by the following procedure: After the adhesions have been cut away a quadrangular piece of skin is fitted into the wound, the same size as the lid, adherent at its summit and base to the skin of the lid, at the level of the bottom of the fornix. After the flap is raised the *cul-de-sac* which has been formed is penetrated by dissection. The flap is now made to slip through the opening, and its summit is sutured to the internal palpebral margin. The operation is finished by approximating the borders of the wound. Three or four weeks later a secondary operation is performed; that is, after the flap is well adjusted to the posterior surface of the lid and is sufficiently nourished. All the cicatricial connections that may have formed between the tarsal and bulbar conjunctivæ are divided, and the inferior opening which communicates with the *cul-de-sac* is enlarged. An horizontal incision is now made along the entire extent of the lid, and the skin is dissected down to the inferior border of the pedicle of the flap. The flap thus formed is reversed, and its summit is applied to the bulbar surface near the corneal margin. The author claims for this operation simplicity and facility of execution and no risk of gangrene of the flap. He believes that it is preferable to the procedure of Harlan, by reason of the flap having a large area of skin connection and covering the denuded surface without being twisted on itself, whilst the wound can be better closed, and a

complete artificial *cul-de-sac* is formed, of which the bulbar and tarsal surfaces are covered by layers of integument which, although in contact with one another on their free surfaces, have common attachments. In a case of cicatricial ectropium, resulting from an injury which divided the lower lid close to the inner canthus, Rockliffe, of Hull, ^{Dec. 17, 192} obtained a satisfactory result from Tweedy's operation. Woodruff, of Chicago, ^{July 10, 1918} reports a successful case of employment of Thiersch's flaps in a case of senile ectropium.

DISEASES OF THE CONJUNCTIVA.

Terson, of Paris, ²⁷⁴ has found *acinous glands* of a sebaceous type, as well as hairs, in the lachrymal caruncle, and has seen a case of furuncle of this organ co-existing with the same condition of the lids. Snell, of Sheffield, ^{May 76} reports two cases of *nævus* of the conjunctiva and one of the plica. In the last the growth was about the size of a small bean and projected slightly between the lids. In the second a portion of the conjunctiva was involved by a series of *nævoid* vessels, and a vascular growth was present at the upper inner angle of the orbit. The third case presented a growth, resembling a blackberry in form, color, and size, which was situated between the conjunctiva and above the cornea. The growth was dissected out, and proved to be an angioma containing considerable fibrous tissue and small calcareous nodules. The first case was cured and the second was benefited by applications of ethylate of sodium.

Krailsheimer, of Stuttgart, ^{June 133} has successfully removed a *cysticercus cellulosa* from under the conjunctiva of a boy 6 years old. When first seen, the parasite had produced a marked degree of exophthalmus, which disappeared after a time. It presented near the rectus superior muscle as an elliptical tumor the size of a hazel-nut. Fuchs, of Vienna, ^{Dec. 8, 192} has seen an instance of *pemphigus* of the conjunctiva where the process had progressed to such an extent that the lids were reduced to mere lines. The secretion of tears was abolished. The disease had spread over the cornea and the vision was nearly *nil*.

Reynolds, of Louisville, ^{Aug. 1007} is of the opinion that all local diseases known as *phlyctenular ophthalmia*, not of traumatic origin, should be regarded as local manifestations of a constitutional dyscrasia; that constitutional treatment is always demanded, and local

treatment, if applied at all, should be mild and soothing, and never stimulating or irritating in character. As prophylactic against *ophthalmia neonatorum*, Valude, of Paris, ¹⁷_{Feb. 9}, recommends the insufflation of a quantity of finely-powdered iodoform into the eyes before the cord is cut. One application suffices, as traces of the powder are found in the folds of the conjunctiva several days after. The author has made use of this method during nearly two years of service with Tarnier, and has not seen a single severe case of ophthalmia developed during that time. He further believes that midwives should be compelled to report all cases of ophthalmia neonatorum occurring in their practice. In the treatment of the disorder during the intervals of cauterization with silver nitrate, he has made use of a solution of extract of opium 0.10 grammes (1 $\frac{1}{2}$ grains), distilled water 1000 grammes (1 quart). If the chemosis is not too marked, he advises a slight scarification with sharp-pointed scissors.

Johnson, of Paterson, ⁷⁶⁰_{Sept. 16}, believes it to be the duty of every physician attending a case of *purulent conjunctivitis* to warn those living with the patient of the very contagious nature of the discharge from the eyes, and, where possible, to isolate both the patient and the nurse in charge. Budin, of Paris, ¹⁸⁸_{Oct. 23, '02}, has treated 665 newborn infants in the Charité with a solution of silver nitrate in the strength of 1 to 150, and has seen but one case of ophthalmia neonatorum develop among that number, that being of the membranous variety. He believes, however, that this favorable result was materially aided by the most careful attention directed toward the production of asepsis in the maternal genitalia. Prior to the stage of labor the mother received a vaginal douche of sublimate in the strength of 1 to 4000. The eyes of the infants were cleansed immediately after birth, and the silver was instilled before the umbilical cord was cut. Phillips, of Savannah, ¹¹⁷_{July}, states that he has never found it necessary to use solutions of nitrate of silver in greater strength than 5 grains (0.32 gramme) to the ounce (31 grammes).

Randall, of Philadelphia, ⁷⁶_{Sep.}, reports a case in which, notwithstanding the employment of the usually efficient prophylactic measures, and the most careful attention from the beginning of the disease, both eyes were lost,—the one after perforation and the other without perforation of the cornea. The author thinks that

faulty general nutrition was the cause of the malignant course of the affection. For the proper prophylaxis and treatment of this form of disease, Fage, of Amiens,²³⁸ _{Sept.} states that the following rules should be carried out under official authority: "1. The hygienic installation of all maternity hospitals and asylums for infants. 2. The vaginal disinfection of women at full term. 3. The obligatory application of Credé's method, or, better still, the instillation of iodoform by midwives. 4. The distribution among parents of information concerning the dangers of ophthalmia of the newborn, and of the precautions that should be taken to avoid it. 5. The isolation of infants afflicted with the disease. 6. The necessity of consulting a physician, and, if possible, an oculist, as soon as the disease shows itself."

In an article entitled "Purulent Ophthalmia from the Stand-point of its Specific Microbic Cause, with a Plea for a More En-ergetic, Rational, Abortive Treatment where Possible," Hinde, of Chicago,¹⁰⁰⁷ _{Aug.} concludes as follows: "1. That all cases of purulent conjunctivitis are of microbic origin, and due to Neisser's gonococcus. 2. That all cases originate from a gonorrhœal focus by devious paths, often, though not always, traceable. 3. That those parts of the conjunctival sac having a cylindrical or a modified cylindrical epithelium, viz., the palpebral portions and that of the fornices, are the seats of election of the micro-organism. 4. That the location of the gonococcus on the mucous membrane is, at first, *super*-epithelial, then *inter*-epithelial, and, still later, *sub*-epithelial, and all combined. 5. That its special habitat is within the pus-cell, yet it is also *extra*-cellular, as well as *intra*-epithelial. 6. That the associated inflammation of the adjacent lid-tissues is due to the lymphatic absorption of the ptomaines of the microbe. 7. That the compact stratified epithelial layer of the scleral conjunctiva and cornea is very resistant to the attack of the gonococcus. 8. That ocular complications are due to pressure-necrosis, producing an *infection atrium* through which the streptococcus, and, perhaps, the staphylococcus, find ready entrance to tissues with greatly impaired physiological resistance, and often rapidly destroy them, causing perforation of the cornea, *intra*-ocular infection, and loss of the eye. 9. That the therapeutical indication is the mechanical removal or destruction of the gonococcus with its ptomaine, and that, if this is done *early and thoroughly in the weeping stage*, the

period of acute inflammation will be cut short and the ocular complications avoided. 10. That it is well, in the incubative stage, even without positive evidence of a gonorrhœal origin, to regard with suspicion all cases of severe monocular catarah, *and especially so in the female, irrespective of age or condition*, and to treat them as if due to the gonococcus. 11. That the mechanical removal of the discharges and the loosened epithelia, and therewith the microbe and its ptomaine, *by thorough brushing of the palpebral conjunctiva and that of the fornices*, and ample flushing of the conjunctival sac with simple diluents or weak microbicide solutions, fulfills the etiological indication, and is non-injurious in all severe cases of *simple catarrhal conjunctivitis*. 12. That, of all local remedies, nitrate of silver is the most potent and, at the same time, least irritating microbicide we possess. It prevents complications, and can be used in sufficient strength to destroy the gonococci without risk of injury to *intact* ocular tissues, and that solutions of greater strength than 2 per cent. are unnecessary. 13. That in cases where complications already exist, when first seen, brushing of the palpebro-fornix conjunctiva should be resorted to, with thorough frequent irritation of the conjunctival sac, preferably with sublimate solutions up to 1 to 5000. If undue lid-pressure exist, *free canthotomy* is advisable, but *scari-fication of the sero-fibrino-plastic chemosis of the scleral conjunctiva does not relieve exudative pressure on the ocular tissues, while it opens the doorway for secondary infection with pus-microbes and is a dangerous proceeding*. 14. Where the cornea alone is inflamed, the added, guarded, daily use of a bichloride solution, 1 to 500, to the infected area is the best treatment, together with myotics, not upon account of the latter's myotic action, but because, after a preliminary increase, they reduce intra-ocular tension by contracting the blood-vessels and diminishing serous exudation, and thereby improve the nutrition of the ulcerated, softened, corneal tissues. *Paracentesis of the anterior chamber, through the bottom of the ulcer, is called for only in those cases where perforation impends, or where positive, progressive, intra-ocular infection exists*. 15. The use of a mydriatic is best limited to those complicated cases where the uveal tissues are threatened or inflamed, because, after a preliminary reduction, it increases the intra-ocular tension by impeding the outflow of fluids

from the eyeball, thus resulting in increased posterior pressure on the softened cornea, impairing nutrition and aiding bulging. 16. A supporting compress-bandage is antiphlogistic and of great use in preventing staphylomatous results in complicated cornea, and its use should be continued until the healed cornea is again unyielding. 17. Ice-cold applications check microbic multiplication and should be used assiduously to the end of the acute stage, or until ocular complications ensue. After the latter occur, applications as hot as can be borne are more comfortable, and more conducive to the improvement of the nutrition of the impaired ocular tissues. 18. As a prophylactic in monocular cases, the other eye should be sealed against infection, and the risks to others from these causes should be thoroughly advertised. 19. The treatment of the initial focus of infection, when ascertainable in the infected subject, must be rigidly carried out on the same lines, and simultaneously with the conjunctival inflammation."

In the treatment of purulent conjunctivitis, Terson, of Paris,²⁷⁴ Oct., '92 without abandoning the traditional methods, has made use of irrigations of permanganate of potassium with excellent results. The irrigations may be used in infants as well as in adults, and should be performed with the assistance of a blepharostat provided with perforations, especially constructed for the purpose. The author has used the drug in the strength of from 1 to 2000 or from 1 to 5000, according to the degree of severity of the disease. The irrigation is but slightly painful, and a purulent discharge is soon converted into a serous one, leaving a slight palpebral œdema, without any characteristic lardaceous thickenings. Essad, of Constantinople,¹⁷³ Jan. uses sufficiently strong solutions of nitrate of silver, conjoined with frequent warm irrigation, preferably with boric-acid solution, as often as four times daily. Foucher, of Montreal,¹⁰¹⁸ Jan. amongst other therapeutic measures, resorts to the direct application of ice to the lids, being convinced that this method affords the best means of getting rid of the chemosis and œdema of both lids and conjunctiva. Montgomery, of Chicago,¹⁰¹⁸ Jan. has found that nitrate of silver is inefficient in solutions of a strength less than 60 grains to the ounce (4 to 31 grammes). Crocq⁸⁶⁸ Aug. 19 claims to have had excellent results from the following combination: Sublimate, 0.02 gramme ($\frac{1}{3}$ grain); Sydenham's laudanum, 0.50 gramme ($7\frac{1}{2}$ grains); distilled water, 150 grammes

(4½ ounces). As soon as the discharge becomes thick and watery, this collyrium is to be substituted by a wash of sulphate of zinc and boracic acid.

In a case of purulent ophthalmia in which perforation of the cornea had occurred, Mitchell, of Hornellsville,³⁴⁷ _{Dec., '92} claims to have seen a visual acuity equaling $\frac{2}{3} \frac{0}{0}$ temporarily restored to the eye as the result of a blow which had dislocated the crystalline lens into the perforation in the cornea. Eliasberg, of Salonica,¹⁹⁰ _{Apr.} has seen an attack of purulent conjunctivitis eradicate a thick pannus that had previously resisted all other local treatment. The conjunctivitis was evidently of gonorrhœal origin, the patient, a girl aged 17 years, having a vaginal leucorrhœa. Deeming it impossible, in many cases, to detect the presence of a leucorrhœa which may exist in a sufficiently malignant form to induce the disease, Prince, of Springfield, Ill.,⁵⁹ _{Aug., '20} urges the employment of Credé's prophylactic treatment of ophthalmic neonatorum in private as well as public practice.

Eliasberg, of Salonica,²⁷⁴ _{Feb.} reports an instance of *croupous conjunctivitis* that was complicated by disease of the entire cornea. An abscess involved the lower half of this latter membrane. The usual treatment was directed toward the disorder, but, failing to arrest the progress of the disease, a dressing of aristol was applied. This was followed in a short time by the most favorable results. At the end of a month the conjunctiva became normal, without passing through the usual stage of catarrh, and the cornea entirely recovered its transparency. The author does not believe that this form of conjunctivitis has anything to do with the variety caused by diphtheria. He defines it as a benign disease, quite rare, which may affect young infants. The prognosis is favorable, the greatest complications occurring in the cornea. Uthoff, of Marburg,⁴ _{Mar., '13} has found diphtheria bacilli in a case of croupous conjunctivitis occurring in a child, 5 years old, who failed to exhibit constitutional symptoms.

As bearing on the etiology of *trachoma*, Ottava, of Budapest,¹⁹⁰ _{July} cites three instances to confirm his view that this disease is only a symptom, the first case being seemingly caused by gonorrhœa, the second by scrofula, and the third by syphilis.

Chibret, of Clermont-Ferrand,⁷⁸ _{Mar.} believes that spring catarrh is an attenuated form of trachoma, the affection of the conjunctiva

of the lid being primary, and the immediate cause of the hypertrophy of the limbus. He has good results from vigorous friction of the lid with mitigated nitrate-of-silver stick. Williams, of St. Paul,⁷⁶ prefers the term *hypertrophic conjunctivitis* to that of *trachoma*, as more definitely indicating the pathological condition present. He employs a solution of bichloride of mercury of such strength as not to cause serious reaction. Ottava, of Budapest,¹⁹⁰ makes use of the following procedure: After anaesthetization of the conjunctiva with cocaine, the upper lid is turned over and a spatula, with an everted end especially constructed for the purpose, is thrust into the fornix. The spatula is held horizontally and the conjunctiva is rubbed increasingly harder for half a minute, when the lid is returned to its place and the bulbar conjunctiva and that of the lower lid are similarly treated. After the massage, the conjunctiva is touched with silver or sublimate solution, or with a crystal of sulphate of copper. This procedure is repeated at frequent intervals until the conjunctiva is clean. The author claims that this method is the simplest, as it avoids the use of a general anaesthetic and complicated instruments, is without danger to the patient, and does not unnecessarily disturb the conjunctiva. Troussseau, of Paris,²⁷⁴ reviews the methods of treatment proposed by different authors. The procedure of Darier and Abadie has not been as successful in his hands as in their own. He has used it in seventy-five cases, and has seen but one grave complication result from its use,—a case of total symblepharon due to neglect in the dressing. If a radical cure of the disease could be obtained by this method of treatment, the pain and great local reaction following the operation might be atoned for, but he has never seen a single instance of permanent cure. In four or five instances he has found small abscesses in the cornea about a week after the operation. In all cases it was necessary to follow the treatment with a local application of caustics in order to avoid relapses. In regard to the treatment proposed by von Hippel, the author concludes that its results are most satisfactory in slight cases, but in order to effect a cure it is necessary to follow the treatment with cauterization with copper. He has also employed Knapp's forceps with advantage, but states that this procedure must be frequently repeated and should always be accompanied by a vigorous rubbing of the conjunctiva with sublimate. He concludes that there is no one

method applicable to all cases, but that the variety, the intensity, and the location of the disease should always determine the particular form of therapeutic interference. Hoor, of Budapest,²⁹⁷ Mar. 18 believes the sovereign remedy to be silver nitrate. In chronic cases, washing with corrosive sublimate and the application of the galvanic cautery are often valuable adjuvants.

From the results obtained by the treatment of two hundred cases, Knapp, of New York,²⁴⁹ Jan. concludes that rapid, perfect, and permanent recovery by expression alone, or expression followed by mild caustic treatment, takes place in the majority of cases, especially of the pure follicular type; that imperfect recovery—*i.e.*, disappearance of trachoma, leaving more or less shrinkage of the conjunctiva—results, as a rule, in old neglected cases of inflammatory trachoma; that relapses that are cured by a second or third operation occur in both the simple and inflammatory forms, and that the operation itself has never injured an eye. Gepner, of Warsaw,¹⁹⁰ Oct., '92 has found Knapp's roller-forceps to be the most expeditious and surest method of treatment, particularly applicable where the fornix and palpebral conjunctiva are covered with large follicles. Peters, of Bonn,²⁰⁴ v. 39, II, 2 has been led to make use of the following method: A straight, blunt, linear knife, after the form of a Desmarres "scarificator," is employed. The conjunctiva is carefully scraped, care being taken not to exercise too much force. The region of the caruncle and of the plica semilunarius is curetted. The reaction is but slight, and the effects most gratifying; pannus being cleared up, defects in the epithelium restored, and the surface of the conjunctiva made smoother. The procedure was of no value in cases of acute follicular catarrh, while in five cases of spring catarrh the symptoms of irritation were lessened. Of cases of simple chronic conjunctival catarrh, he obtained the most benefit in the dry variety. There were no bad results in any form of conjunctivitis. He regards antisepsis unnecessary in the treatment of trachoma, as the mechanical removal of the epithelial layer of the conjunctiva is simply sufficient.

Stephenson, of London,⁷⁶ Jan. considers "expression" indicated in follicular disease and in recent and obstinate cases of trachoma. He limits excision of the *cul-de-sac* to "those examples of chronic trachoma in which the ordinary treatment by escharotics has proven unavailing, and to those cases in which the upper fornix is

occupied by a mass of voluminous and reddened conjunctiva, often folded in an extraordinary way." He describes a modified operation for excision, and attaches considerable importance to non-interference with the eye for four or five days after the operation. Vinsonhaler, of Little Rock,^{506 June 15} considers it unessential what strength of bichloride is employed after the expression operations, as the effect of the drug is purely astringent, unless used in strengths that are greater than 1 to 500, when it increases cicatricial contraction and any tendency to entropium.

Abadie, of Paris,^{274 Oct., '92} reports 130 additional cases treated by the Abadie-Darier method. He states that Veger, of Algiers, and Petrescu, of Bucharest, have used the method with great success; the latter in 500 cases with only three failures. Claiborne, of New York,^{771 Aug. 15} considers the "expression" treatment of granular conjunctivitis eminently indicated in those cases in which the frog-spawn granulations occur. Hodges, of Galveston,^{1007 Dec., '92} has treated three cases of chronic trachoma with a solution of jequirity, which, although wrapped and sealed, had been prepared several years previously. Daily applications of the infusion were made; in the first case for a period of seven weeks, in the second for six weeks, and in the third for three weeks, without exciting a more serious inflammation than catarrhal conjunctivitis. In two of the cases the results were highly satisfactory, and for this reason the author is led to conclude that the curative effect of jequirity is due to some principle in the drug not yet recognized, and not to the destructive action of the excited inflammation. Emerson, of New York,^{1 Feb. 11} has found jequirity beneficial in those cases of granular conjunctivitis where there is superficial vascularity of the cornea. He has also used the drug with advantage in the fibrous condition which often follows. Applying the argument of Lindeman, as advanced in his paper on blennorrhœal arthritis, Wallace, of Philadelphia,^{112 Nov.-Dec., '92} explains the favorable action of jequirity in the treatment as being due to the destruction of gonococci by the common organisms of pus. Ring, of New Haven,^{2004 '92} states that he has never seen any ill effects from the employment of jequirity.

In regard to the treatment by pyotktanin, Trouchaud^{62 Feb.} concludes that the drug has a certain and lasting action in granular conjunctivitis where the inflammatory action is not pronounced. It is necessary to examine the cornea after each application. Its

employment is dangerous when the cornea is not intact; that is, when the epithelium is exfoliated, even though the loss of substance is but slight in extent. For fear of provoking sphacelus of the conjunctiva and ulceration, abscess, and necrosis of the cornea, it should not be prescribed when the granulations are accompanied by intense reactionary phenomena. Every other symptomatic treatment is indicated in these cases, and, if necessary, the method of grattage, as suggested by Darier and Abadie, should be tried. Of four cases treated by pyoktanin, Legros¹⁹³ has had satisfactory results in three instances, following a three-month course of treatment. The coloring of the skin and of the cornea produced by the drug is, he believes, the strongest argument against its use.

Lydston, of Chicago,¹³⁹ Aug. has treated a series of cases of pannus resulting from trachoma with papoid, and concludes that this proteolytic agent is a very efficient and safe method of treatment in this class of cases. From a study of the eyes of ten hundred and eighteen patients affected with trachoma, Hoor, of Budapest,⁵⁷ Mar. 6 concludes that the best remedies that can be employed in the treatment of this disorder are silver and copper. He has found washing with sublimate and the application of a galvano-cautery of service in many instances. He calls attention to the frequency of the association of pinguecula and pterygium with the disease. The latter is developed from the former, and the pinguecula arising from chronic inflammation of the conjunctiva. As bearing on the etiology of trachoma, the author cites an instance of a man suffering from gonorrhœal conjunctivitis, of auto-infection, in one eye, whose other eye became inoculated eighteen days later by a pure subacute trachoma. The author thinks that the infecting agent was the modified secretion of the eye which was affected with the pure inflammation.

Steiner, of Soerataya,¹³ June 15 has observed a disposition to the deposit of *pigment-particles in the conjunctiva* of the Javanese, especially after trachoma. He found the pigmentation in the epithelial and subepithelial tissue within or without the cells. Berry, of Edinburgh,² Nov. 19, 92 describes a variety of chronic conjunctivitis characterized by an hyperplasia of the conjunctiva of the lower lid, independently or in consequence of incomplete absorption of infiltration from conjunctivitis. Chemosis and swelling of the preauricular glands were present in marked cases.

Speville, of Paris,¹⁷¹ Sept. reports two cases of infectious conjunctivitis. In the first instance the patient lived over a room inhabited by a pork-seller, while in the second the patient was exposed to the fumes arising from a dungheap. The latter case was further complicated by a severe attack of influenza. The author agrees with previous observation, that the disease is doubtless due to animal contagion. The disorder affected the conjunctiva of the upper lid of but one eye in the first case. The ganglia of the parotid gland and those of the cervical region were tumefied. In the second instance the disease took on a more acute form. Here it was attended by the presence of a fungous mass in the deep portion of the superior *cul-de-sac*. Infiltration of the cornea ensued, which spread and increased in intensity very rapidly.

Schwartzschild, of New York,⁵⁹ Apr. 22 has seen a case of *mucous patch of the conjunctiva* complicated by a pseudomembranous formation in a woman, 20 years of age, who exhibited other secondary lesions of syphilis. The conjunctiva of the lower eyelid was swollen and congested and covered by a pseudomembranous exudate. Upon the removal of this membrane a grayish mucous plaque was revealed, measuring twelve millimetres by two millimetres and elevated one-half millimetre. The patch was excised and found to consist of a connective-tissue stroma containing small round-cells in large numbers. The deeper layers of the epithelium were intact except at the centre of the mass, where ulceration had commenced. Adhering to and covering the inflammatory mass was a reticulum of fibrin inclosing degenerated blood-corpuscles and emigrated leucocytes. The walls of one of the conjunctival vessels were infiltrated with leucocytes, while the second contained small round-cells. Fromaget, of Bordeaux,⁷⁰ Aug. 6 reports an instance of a syphilitic ulcer of the bulbar conjunctiva. The initial lesion had occurred eighteen months previously. Under general antisyphilitic measures the local manifestation disappeared promptly.

Adams, of Kent, Eng.,² May 13 describes a form of ophthalmia met with among hop-pickers. The symptoms are similar to those of muco-purulent conjunctivitis, not uncommonly complicated by hypopyon keratitis. The author considers it probable that the disease is due to the introduction of the spinous processes of the hop-plant into the eye. Bronner, of Bradford,⁷⁶ May has seen a peculiar form of *membranous conjunctivitis* occurring in a case of

recurrent iritis. A thick, grayish membrane was found covering the anterior segment of the eyeball, closing in the palpebral fissure, and adhering to the tarsal conjunctiva of both lids. The bulbar conjunctiva was red and swollen, and the cornea was ulcerated at the periphery. The membrane reformed after a single removal, but, upon detaching it a second time and applying nitrate of silver to the conjunctiva, no further development occurred. No characteristic micro-organism was discovered in the membrane.

Krueger, of Bonn,²⁵⁴ _{Oct., '92} reports two cases of *ophthalmia nodosa* in addition to those already cited by him. In the first instance the diagnosis was made by the appearance of numerous nodules under the conjunctiva and in the iris. These nodules were flat and oval, of a yellowish-white color, and were of firm consistency. There were no signs of ulceration. The nodules consisted of retinal cells surrounding a fragment of a caterpillar-hair, no giant-cells being found. The largest nodule on the iris was removed by an iridectomy. The second case was remarkable on account of a black groove, seven millimetres long and one and five-tenths millimetres wide, which appeared on the iris. The nasal half of the groove was crossed by a fine white thread, which disappeared in a characteristic-looking nodule. Two subconjunctival nodules were excised in this patient. These were found to consist of round-cells which had partly degenerated. As in the two cases previously reported, the variety of caterpillar known as *Bombyx rubri* was supposed to have caused the disorder. The disease showed a marked resistance to therapeutic measures, treatment being directed to the first case two and a half years before healing was effected. Total blindness resulted in the second instance. The author recommends the performance of an iridectomy, with the removal of such nodules, as soon as possible.

Roberts, of Manchester,² _{June 10} cites an instance of *tubercle of the conjunctiva* in a boy 15 years of age. The condition resembled that of trachoma; the membrane was greatly shrunken and the eyeball was atrophic. Microscopic study showed giant-cells, but no bacilli.

From a study of forty-one cases of *ophthalmia leprosa*, Hulanicki, of St. Petersburg,²¹ _{June 17} has found the ocular manifestation to be usually a part of the general disease. Men and women alike were affected with the disorder, while the young and those in

middle-life were found to be particularly predisposed to it. The lids were usually affected, while the conjunctiva was singularly free from the infiltration. The episcleral tissue was found to be prone to inflammation and the corneal disease assumed one of two forms. When the iris is involved, the ciliary body is usually prone to suffer at the same time. Carpenter, of Philadelphia,¹¹⁹ Jan. reports two instances of *sloughing of the conjunctiva* from insufflation of calomel into the eyes of patients taking potassium iodide.

In a case of recurrent *pterygium*, Hamilton, of South Australia,²⁶⁷ Feb. 15 operated successfully by covering the exposed sclerotic with a pedicled flap of conjunctiva, obtained from above the cornea. De Schweinitz, of Philadelphia,¹⁰¹⁸ Apr. reports the successful employment of Thiersch's skin-graft, in a case of large pterygium with moderate symblepharon following a lime-burn.

Savage, of Nashville,¹⁰⁰⁷ Mar. claims to prevent relapses after operating for pterygium by making a vertical incision in the conjunctiva "above and below, each about $\frac{1}{8}$ inch long and about $\frac{1}{2}$ inch from the most projecting part of the denuded margin of the cornea." Hotz, of Chicago,¹⁰¹⁸ Apr. has found Thiersch's skin-grafts useful for repairing defects of the conjunctiva in the following conditions: 1. For the relief of extensive adhesions of the lower lid to the eyeball following the destruction of the palpebral and ocular conjunctiva by lime or hot metal. 2. For the relief of excessive shrinkage of the conjunctiva in trachomatous eyes. 3. For enlarging contracted conjunctival pockets to allow of the insertion of an artificial eye. 4. In certain cases of pterygia.

DISEASES OF THE CORNEA AND SCLEROTIC.

In a case of *epithelioma of the sclero-corneal margin*, which had repeatedly recurred after removal by dissection, Alt, of St. Louis,³⁴⁷ June finally employed a galvano-cautery. Three years later there had been no relapse.

In the treatment of *corneal ulcers* in children, Baasner, of Worms,⁸⁶³ Jan. believes that atropine is often injurious, and that its use is contra-indicated when the ulcer is situated near the periphery. According to Barck, of St. Louis,⁹⁶³ July the only proper indication for the use of eserine in the treatment of corneal ulcers is where a peripherally-placed area of inflammation threatens perforation.

Blumenthal, of Riga,²¹ believes that lead is of great service in the treatment of corneal ulcers complicating catarrhal conjunctivitis. Moulton, of Fort Smith,⁷² has had satisfactory results with europhen in vaselin in 2-per-cent. strength.

In cases of *ulcerative keratitis*, Ring, of New Haven,¹ claims good results from cauterizing the blood-vessels at the corneo-scleral margin. Pitts, of St. Joseph,¹⁰¹⁸ considers the actual cautery the safest and surest of all agents in the treatment of ulcers of the cornea. Fukala, of Pilsen,¹³ treats corneal ulcer as an open wound, by removing all the superficial tissue with an iris scissors and forceps. De Wecker, of Paris,¹⁷¹ has found that scraping and cauterizing the diseased tissue instantly relieves the pain and photophobia. The new tissue is more transparent than that which follows any other mode of treatment. In cases of ulceration of the cornea occurring in "lymphatics," where the process of repair is sluggish, notwithstanding that a leash of blood-vessels supplies the ulcer, Dunn, of Richmond,¹ advises the performance of peritomy, as the operation is followed by subsidence of photophobia and lachrymation. In a case of extensive ulceration of the cornea and conjunctiva, Searles, of Oshkosh,³⁴⁷ has prevented adhesion by the employment of an eye-shell made of vulcanized rubber.

Truc, of Montpellier,²⁷⁴ states that certain obstinate corneal affections often have their origin in disturbances of the lachrymal passages. Melinger, of Basel,²¹⁴ believes in the conservative treatment of *hypopyon keratitis*, and makes use of subconjunctival corrosive injections and linear cauterization of the bulbar conjunctiva. Milliken, of Cleveland,⁴⁵¹ gives notes of several cases of serpiginous and hypopyon ulcers of the cornea successfully treated by the galvano-cautery, which he prefers by reason of its being readily controlled and easily kept at any desired temperature. Keyser, of Philadelphia,⁷¹ very strongly recommends the use of salt baths and the internal administration of sulphide of calcium in the treatment of strumous children suffering with *phlyctenular keratitis*. In the treatment of corneal inflammations and opacities, Chauvel, of Paris,¹⁷³ has found hot boracic-acid compresses and calomel insufflations most efficacious. Of seventeen cases of interstitial keratitis, syphilis was established as the cause in four instances.

Eliasberg, of Salonica, ²⁷⁴ Mar. has seen binocular non-vascular *par-enchymatous keratitis* in a young man suffering from gonorrhœa. There was no specific history. The ocular affection ran a mild course, and resulted in a perfect cure under mixed treatment. The author thinks that a careful examination would reveal a gonorrhœal origin in many similar cases. In three cases of *relapsing keratitis*, accompanied by marked photophobia and lachrymation, seen by Patterson, of Michigan, ¹⁰¹⁸ Apr., the cause was traceable to masturbation. He also reports a case of diplopia in a boy of 5 years of age, where the causative factor seemed to be an adherent prepuce.

Emmert, of Berlin, ¹⁹⁰ Dec.,⁹² believes that *herpes corneæ* and *keratitis dendritica* are essentially different diseases, and gives notes of eleven cases of the former condition. He holds that the latter disease is very rare, that there is no vesicular stage, and that it may occur in individuals in good health, although all the cases he has seen appeared in scrofulous subjects. The onset is rapid and there are marked conjunctival symptoms. In regard to the pathology of *herpes corneæ*, the general symptoms which accompany the disease point to local interruptions in the circulation, resulting in small abscesses. Wilder, of Chicago, ⁹ July 16, considers dendritic keratitis an herptic disease of the cornea due to constitutional causes, malarial poisoning being very prominent. He has found but little effect from local treatment except by cauterization of the ulcer with carbolic acid. A case of *keratitis dendritica* has been seen by Dunn, of Richmond, ¹⁰¹⁸ Apr., in a woman aged 31 years. About ten days after the appearance of the ulcer, *herpes zoster* of the lid was detected. The affection was accompanied by intense pain, which was relieved by the use of the galvanic current. Morton, of Minneapolis, ¹⁰¹⁸ Apr., has also observed two cases of the same disease, both of which were unassociated with herptic trouble, and were apparently much benefited by insufflations of aristol. Mueller, of Vienna, ⁵⁷ June 26, has observed an instance of *keratitis neuroparalytica* in a patient in whom the first branch of the fifth nerve was alone affected. The causal pathological process was thought to be situated in the Gasserian ganglion.

Spicer, of London, ² Dec. 17, 192, has had some success in the treatment of *keratomalacia* in young children by increasing the amount of nitrogenous food and by the administration of codliver-oil; the local treatment consisted of eserine ointment and warm fomenta-

tions. In the treatment of cases of keratitis neuroparalytica, Panas, of Paris, ¹⁷³ Nov., '92 believes the chief indication to be protection to the eye by occlusive dry dressing, and the application of vaselin and iodoform, whilst he states that, in general, treatment should be directed to the underlying cause. The cornea does not suffer from its exposure to traumatism alone; but there is also a trophic change, which permits the action of trauma to be more deleterious than it would otherwise be. Terson, of Paris, ¹⁴ July '12 reports an instance of *unilateral ophthalmic zona* and *double destructive keratitis*, which supports the trophic theory of the origin of keratitis neuroparalytica. Both corneæ were lost by the same process. At the end of an attack of herpes zoster, which had produced a classical keratitis of one side, the second eye, which had been healthy, became attacked in exactly the same way and by the same disease without the development of a new zone.

E. Treacher Collins, of London, ⁷⁶ Aug. has made a clinical and pathological study of four cases of *ring infiltration of the cornea*. In every instance the affection followed a perforating septic wound of the cornea, and the ring infiltration occupied precisely the same position, its outer edge being one millimetre distance from the corneal margin, irrespective of the position of the wound. Microscopically, the cell-accumulation between the laminæ of the cornea was found to be densest at a position almost equally distant from its anterior and posterior surface, or slightly nearer the anterior. Collections of cells were also sometimes found between Descemet's membrane and the corneal substance. Schoeler, of Berlin, ³⁵³ Oct., '92 reports a case of cloudiness and partial decomposition of the layer of Descemet as a result of senile degeneration. The author inclines toward the view held by Wagenmann, that the origin of the disease is in the endothelium. He believes that the arterial disease, as manifested by narrow retinal vessels with sharp-angled curvatures, was doubtless the previous factor.

Meyer, of Paris, ⁷⁸ Jan. has seen four instances of a peculiar form of infectious keratitis. The subjective symptoms were almost *nil*, whilst objectively there was a small round spot in the pupillary centre of the cornea underlining Bowman's membrane. This spot enlarged temporarily and then was surrounded by a grayish semi-transparent halo. The disease remained stationary or the halo was surrounded by a whitish band. In every instance the disorder

followed a debilitating illness. Topolansky, of Vienna, ⁵⁷ has seen a case of "band-like keratitis" in a hat-maker who occupied himself in handling hare-wool. The author believes that this substance had eaten its way under the epithelium, giving rise to the above condition. He also thinks that this form of disease, so frequently seen in masons, is due to a deposit of chalk in the corneal lymph-spaces. Schiess, of Basel, ²⁰⁴ _{v.38, No.3} has seen an instance of "ribbon-like" keratitis in a man 31 years of age. Both eyes were affected. The patient was placed under pilocarpine, but attributed his cure to eating large quantities of sour pear-juice in the autumn. The tension was high in both eyes.

Nuel, of Liége, ²⁷⁴ _{Oct., '92} has investigated the subject of *filamentary keratitis*, and has found it to be more frequent in the old than in the young. The primary growths seem to originate from a state of prolonged congestion of the cornea. These first appear as little spheres, which later become filamentous. There are a few signs of ciliary irritation: the cornea clears and becomes normal. In part, these filaments seem to have an epithelial origin, consisting of a gradual elongation of the surface-cells of the cornea. These are mingled with cells that are deposited from the conjunctival mucus. The author suggests that the peculiar twisted condition is due to the mechanical action of the lids.

Hess, of Leipzig, ²⁰⁴ _{v.38, No.2} maintains the truth of his previous assertion that "*band-like*" keratitis arises from the epithelium of the cornea. He believes that the pathological state which produces this condition favors a ready separation of the epithelial cells from Bowman's membrane. The disease is found to occur in cases without particular cause, especially without any previous history of traumatism; again in instances where there has been superficial wounds, burns, etc. He has, further, seen it in cases where luke-warm sublimate and boracic-acid dressings have been used. Rarely was the epithelium in the neighborhood of the band found normal. In the vast majority of instances these cells were characteristic-ally altered. At times large round or slightly elliptical cells were seen, with a markedly regular contour and provided for the most part with a nucleus of normal size. Sometimes the microscope revealed cells of like size and form with homogeneous and glittering contents, and with the nuclei pushed to one side. A third class of cells contained a fine granular substance, which was,

doubtless, the result of degeneration of cellular nuclei. Another group consisted of a large central cell, surrounded by concentric layers of cells that had been compressed by the large one. The large cells sent out numerous processes. These gave a hyaline reaction. There were also numerous cells, half the size of this last class, evidently the result of degenerative processes; and particularly interesting irregular formations, very rich in nuclei. In the immediate proximity of the roots of the band were elongated spindle-shaped cells, which could be followed directly into the commencement of the bands. The author believes that the special form of band-like keratitis which is developed after discussion has quite a different origin from the foregoing variety, and that the condition is caused by vitreous tissue which is squeezed out of the eye at the time of operation.

Nuel, of Liége,²⁷⁴ _{Apr.} has made another study of the growth of filaments from the surface of corneal wounds and ulcers. One of these filaments, removed with a part of its basal attachment from the cornea of a man, had become opaque from the effects of a traumatism. The filament consisted of a conical base, composed of elongated epithelial cells twisted around one another, forming a branched rope with two ends, containing highly-refracting nuclei. This rope was surrounded by a sheath, and in the epithelium about the base of a small filament close to the one just described were four capsules, containing highly-refractive binuclear and poly-nuclear cells similar to those found in the bulbus ends of the large filament. Examination of the epithelium showed the superficial layer to be composed of large cells, while the deeper one was made up of normal polygonal cells with isolated and grouped capsules scattered through them. These latter arose from ordinary epithelial cells by division of the nuclei. There were also albuminoid granules in the superficial layers, regarded as the products of torsion degeneration. The capsules have a tendency to raise themselves above the level of the epithelium supported on epithelium cells, and these, by continuous growth and torsion, form spiral filaments. Infecting ulcers with a gray base are produced by an epithelial change analogous to the preceding variety, but the capsules do not go on to the formation of filaments.

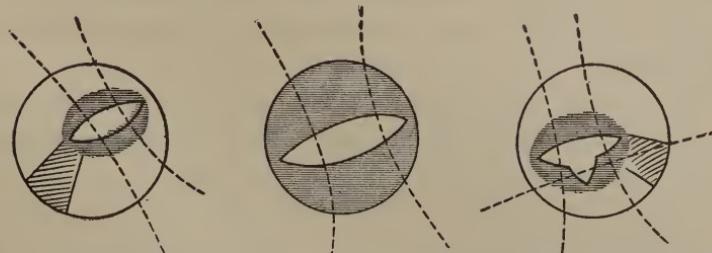
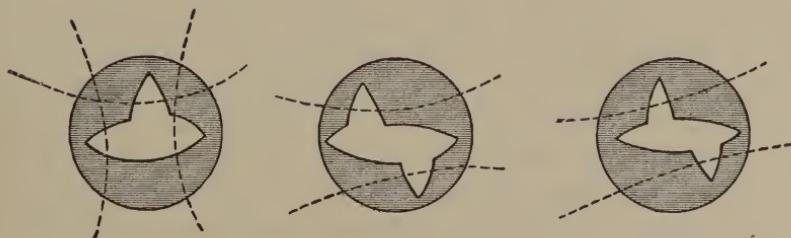
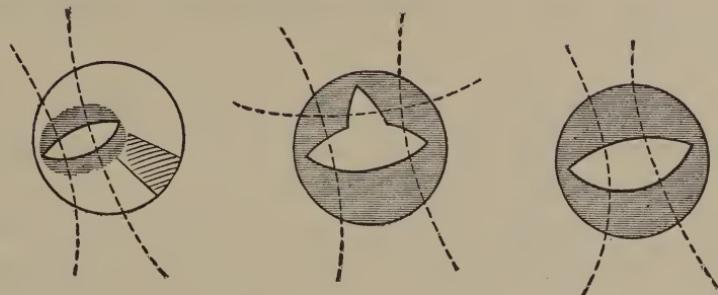
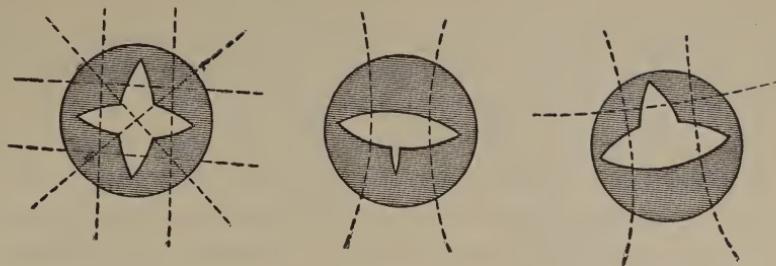
Schiess-Gemuseus, of Basel,²¹⁴ _{June 1} has removed two *tumors of the conjunctiva*,—one, a fibroma, from a boy aged 16 years; the other, a

papillary overgrowth of the epithelium. The author is inclined to view the second instance as one of sarcoma, upon account of the predominance of the red blood-corpuscles in the deeper layers. He calls attention to the importance of removing all traces of these growths with the cautery. Doyne, of Newcastle-on-Tyne,^{Feb., '94} suggests that the small foreign bodies found firmly adherent to the cornea may be the so-called "*scale insects*." Froelich, of Berlin,^{July 25th} has performed the operation of *keratoplasty* upon two cases of permanent cloudiness of the cornea, the result in both being the same. In the first case the periphery of the cornea was leucomatosous, with an almost clear pupillary area, whilst in the second the periphery was almost unaffected, while the pupillary area was clouded. The author believes this operation to be less dangerous than the removal of the entire cornea. After he has removed the plug of corneal tissue with the trocar, he tries to get down to clear corneal tissue by gentle cauterization of the bottom of the wound with a platinum wire.

Knapp, of New York,^{Oct., '92}²¹⁹ has treated five cases of *keratoconus* with the galvano-cautery. In three instances the cornea was perforated after the apex of the cone had been cauterized, whilst in the other two the perforation of the cornea was omitted. The author prefers this latter procedure, although a repetition of the cauterization may be necessary. He obtained the best results with an oval electrode.

Scott, of Cairo,⁷⁶_{Sept.} has operated upon thirteen cases of *staphyloma of the cornea* by the following method: The base of the tumor is transfixed by a linear cataract-knife, and made to cut its way out by a gentle sawing motion. The piece of cornea to be removed is then seized by a pair of strong forceps and the remaining incisions made. The needles at the end of a double-armed suture are then passed through the lips of the wound from the posterior surface of the cornea, and very lightly tied, so as to merely approximate the edges. The stitches are removed in from four to six days. The author advises the use of a knife in removing the corneal tissue, so as to prevent bruising of the membrane. The accompanying sketches demonstrate the shape of the portion of the cornea removed and the positions of the sutures employed in each of the cases.

In cases of *episcleritis*, Van Moll, of Rotterdam,³⁵³_{Oct., '92} concludes



SITUATION OF SUTURES USED IN OPERATION FOR STAPHYLOMA OF THE CORNEA. (SCOTT.)
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that the results obtained from subconjunctival injection of corrosive sublimate have been more successful than in cases of kerato-scleritis and keratitis. He has seen excellent results follow this method in iritis, iridocyclitis, and keratitis.

In treating *incised injuries* of the sclerotic, Snell, of Sheffield,¹⁰⁷⁷ Feb. 15 secures apposition of the lips by drawing together the edges of the conjunctival wound by means of one or more sutures. Alt, of St. Louis,³⁴⁷ Mar. has seen a case of *gumma of the sclerotic* in a married woman 35 years of age. Other secondary lesions manifested themselves later. The growth disappeared under the local use of calomel and the internal administration of iodide of soda and mercury.

DISEASES OF THE IRIS AND CILIARY BODY.

Dujardin, of Lille,²²⁰ Jan. 6 cites an instance of *partial albinism of the iris* in a man, 57 years old, who showed evidences of an anterior chorio-retinitis complicating a peripapillary choroiditis. By focal illumination the iris presented a uniform coloration; its anterior layers were normal, and there were no signs of pathological change. When light was thrown into the eye, however, by the mirror of the ophthalmoscope, the inferior half of the iris permitted the rays to pass through its meshes. The author believes the cause to be a congenital lack of development. Wintersteiner, of Vienna,⁵⁷ May 21 has had a case of *persistent pupillary membrane* where the presence of corneal opacities would indicate an inflammatory origin. Despaguet, of Paris,¹⁴ June 28 reports an instance of *condyloma of the iris* in a woman, 36 years old, who presented no other evidence of syphilis. The growth disappeared under energetic mercurialization. Upon the subsidence of the inflammation in the right eye the left became similarly affected. Subconjunctival injections of mercury had no effect upon the course of the disease, but general use of the same drug produced a rapid amelioration in the symptoms.

Microscopical examination of a case of typical inferior *coloboma of the iris* made by Holden, of New York,²⁴⁹ Oct. '92 revealed a cleft in the pigment epithelium of the ciliary process, the pars ciliaris retinae being continuous with the coloboma of the iris. The walls of the coloboma, which were turned outward, contained no trace of the sphincter pupillæ. The connective tissue, the mesoblastic

portion of the ciliary process filling the space, showed no signs of previous inflammation. In the pupillary space proper there were numerous fibres and tracts of spindle-cells extending out upon the lens-capsule (persistent pupillary membrane). The posterior capsule was normal. The cause of the non-closure of the foetal cleft was not evident by microscopical examination. Wintersteiner, of Vienna,^{57 July 23} has seen an instance of *traumatic aniridia* where the iris had slipped under the conjunctiva through a rupture in the sclera. By reason of the malposition of the iris it was possible to see the ciliary processes elongate under the use of eserine. The visual field was not larger than normal.

Cocks, of New York,^{219 Jan.} gives the notes of a case in which a piece of glass lodged on the iris and remained *in situ* seventeen months without exciting inflammatory symptoms, vision equaling $\frac{15}{xv}$. At the end of this period the foreign body became dislodged and fell into the anterior chamber, from which position an unsuccessful attempt was made to remove it. Bettman, of Chicago,^{779 July} has successfully removed a piece of steel from the iris by aid of the electro-magnet inserted through a corneal incision made by a keratome. Loehlein, of Giessen,^{69 Aug. 10} has seen a greenish-yellow color given to the iris of an eye perforated by a steel chipping. The foreign body was removed the day of the accident. Keiper, of Lafayette,^{56 Jan.} has successfully removed a piece of wheat-beard from the surface of the iris by means of a corneal section. Cross, of Bristol, and Collins, of London,^{6 July 15} report a case of *epithelial pearl-tumor* in the iris following the implantation of an eyelash into the anterior chamber. When first seen, seven months after the injury, the cilium was extracted and an unsuccessful attempt was made to remove the tumor. One year later the growth had increased in size, and the eye was enucleated on account of sympathetic irritation. The tumor, which was surrounded by pigmented iris-tissue, was found to be free from the cornea, ciliary body, and vitreous, and proved to be a cyst lined by laminated epithelium and containing an opaque white substance, composed of fat-globules and polyhedral cells, probably undergoing fatty degeneration.

Myers, of Richmond,^{81 June} has seen a case of *syphilitic iritis* with gummatous formations in both irides, in which iridectomy was successfully performed after the iris-tissue had become atrophic. In a case of *recurrent iritis*, in which the inflammation was

accompanied by the effusion of a gray exudate into the pupillary space, Zimmerman, of Milwaukee, ²⁴⁹_{Jan.} noted the occurrence of a haemorrhage into the anterior chamber, probably from the severity of the inflammation. The blood appeared coagulated and more than two-thirds filled the chamber.

A case of tumor of the iris is reported by Harlan, of Philadelphia. ⁷⁶_{Sept.} At the age of $2\frac{1}{2}$ years the child became peevish and restless, and developed bronchitis. Subsequently, the right eye became irritable. When first seen, the patient was fairly well nourished and had healthy glands and joints. Examination of the right eye showed iritis with a number of small, yellowish-white, round nodules on the periphery of the membrane. These increased in size and in number, and a yellowish-gray vascular deposit, which rapidly increased in size, appeared upon the outer third of the iris. Upon account of symptoms of irritation in the fellow-eye, enucleation was performed. No tubercle bacilli were found in the growth. Roberts, of Manchester, ²_{June 10} has seen a case of *tubercle of the iris and ciliary body* in a boy 10 years of age, and one of tubercle of the ciliary body and choroid in a young child suffering from general tuberculosis. No bacilli were detected in either case. Van Duyse, of Gand, ²⁹³_{Nov., '92} believes that tubercle of the iris may heal spontaneously, leaving a satisfactory visual acuity. A case of primary tubercle of the iris has been seen by Weinbaum, of Göttingen, ²⁵⁴_{Jan.} in a child whose mother was phthisical. A fruitless effort being made to remove the growth by an iridectomy, enucleation was performed. No bacilli were found, but portions of the growth inoculated into the eyes of a rabbit produced a severe iridocyclitis four weeks later, and microscopic examination of the inoculated eye revealed the presence of a number of bacilli.

Alt, of St. Louis, ³⁴⁷_{Jan.} has noted the occurrence of *iritis* in two cases of gonorrhœa. In one instance the attack had been preceded by purulent conjunctivitis with corneal ulceration. Both cases were complicated by gonorrhæal rheumatism. A case of iritis occurring in the course of Bright's disease has been seen by Schappringer, of New York, ³⁴⁷_{July} in a man 35 years of age. Morax, of Paris, ¹⁷¹_{May} has seen an instance of iritis complicating a case of psoriasis, accompanied by an inflammation of the metatarsal articulation. He points out the analogy between the

ocular manifestation and gonorrhœal rheumatism. The same author instances another case of iritis, in which the inflammatory symptoms recurred without any fresh urethral infection. In the treatment of iritis, Taylor, of Louisville,²²⁴ June 29 has found cocaine superior to other mydriatics, preferably used in the form of an ointment of 25 to 100 parts of petrolatum. The author claims that cocaine can be used for an indefinite time without bad results, and that it does good in iritis by contracting the conjunctival blood-vessels, thus limiting the amount of absorption of the iris. De Schweinitz, of Philadelphia,⁸⁰ June 15 has seen marked improvement follow the subconjunctival injection of corrosive sublimate in gonorrhœal and syphilitic iritis. Quint, of Solingen, has had great success with creasote in two cases of tubercular iritis. Ziem, of Danzig,³⁷ reports three cases of obstinate iritis which yielded to treatment after the correction of different nasal conditions, and believes that septic substances from the nose and its adjoining cavities reach the uveal tract of the eye either through the lymphatics or through the blood.

From a study of the manifestations of *syphilis in the ciliary body*, Galezowski, of Paris,¹⁰⁰ Apr. 18 concludes as follows: 1. Whenever syphilitic iritis is accompanied by a punctate keratitis, either chronic or recent, areas of atrophic choroiditis will be found in the ora serrata. 2. In parenchymatous interstitial keratitis, when due to hereditary syphilis, disseminated plaques, which sometimes reach to the posterior segment, are seen in the ora serrata; more often, however, they are confined to the ciliary region. 3. Diffuse syphilitic choroiditis with disease of the vitreous always presents atrophic alterations of the ora serrata, and the opacities of that humor are due to this latter lesion. 4. In ataxic atrophy of the discs, atrophic and pigment changes occur in the ora serrata. 5. In syphilitic inflammation of the cerebral or cerebro-spinal nerves, characteristic signs of the disease appear in the ora serrata. Scherl, of Dorpat,²⁵⁴ Oct. 92 has had an opportunity of making an histological study of a gumma of the iris and ciliary body affecting the lens, which, from a rounding off of its equator and an increase in the thickness of the lateral half, was asymmetrical. The anterior cortical layer was absent and the capsule open, the lens-fibres swollen and infiltrated. The anterior layer of the zone of Zinn was destroyed on the temporal side, a small-celled infiltration

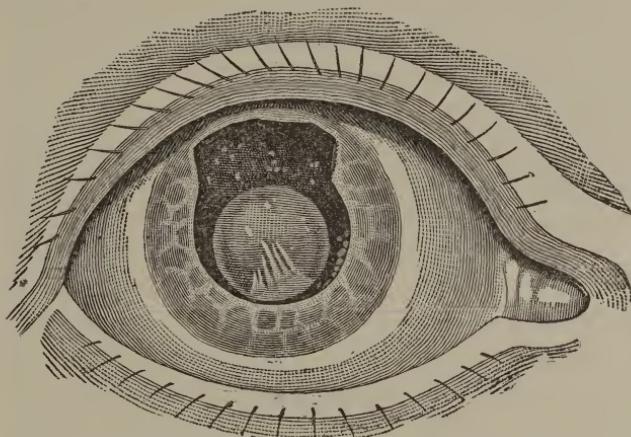
having invaded this part, reaching up to the lenticular equator and filling the spaces of Pettit. The capsule was thrown into many folds by the relaxation, and was unchanged, except at its anterior pole, where its epithelium was much thickened. Here it was continuous as a broad layer between the capsule and lens-substance. The small cells of the gumma had invaded the lenticular substance, having worked their way between the fibres. These cells arranged themselves in rows in spindle-shaped spaces, and were found as well in that part of the lens provided with its capsule as in that which had been deprived of it.

Burnett, of Washington,^{249 Jan.} reports an instance of syphilitic gummata of the ciliary region in a negro 23 years of age, which led to disorganization of the globe, requiring subsequent enucleation. The growth had punctured the sclerotic and cornea and had extended to the back of the lens. The anterior portion of the choroid and the whole of the retina were detached. The mass was composed of small round-cells with only a few fibres of connective tissue. The author reports a second somewhat similar case in a young negro. In both instances the pain was excruciating and continuous. He comments upon the exceptional malignancy of the development of the growths in these two cases, as in his experience syphilitic manifestations are much milder and are more easily controlled in the negro than in the white race. Badal, of Bordeaux,^{70 Dec. 18} has found it necessary to resort to enucleation in a case of *iridocyclitis* where he had unsuccessfully endeavored to relieve pain by a stretching of the external nasal nerve. Salzmann, of Vienna,^{57 Mar. 16} has observed a *melanotic sarcoma of the ciliary body* that had already undergone inflammation. There were also numerous deposits of the growth in the sclera which corresponded to the points of exit of the ciliary veins.

DISEASES OF THE LENS.

Peters, of Bonn,^{204 B. 39, H. 1} has made a careful study of two lenses which presented during life the appearance of *zonular cataracts*. Microscopical examination revealed the presence of a number of empty spaces that were produced post-mortem. The nuclei were especially altered. At the equator a zone of opacity was visible to the naked eye, in intimate relationship with the nucleus and the cortical substance, while the greater part of the anterior and pos-

terior surface of the nuclei were bounded by a layer of fluid, which filled in a broad space between the nucleus and the cortex. The cortical matter, though but little changed, was slightly dislocated from the posterior capsule in both lenses, producing a space which was also filled with fluid. The author believes that this condition was caused by a shrinking of the much-altered nucleus, which produced a dislocation of the cortical matter that was still in connection with it from the posterior capsule. Later on, the nucleus became separated from the cortex everywhere except at the equator, where it was still connected by a narrow band. The nucleus therefore became suspended in a mass of opaque lens-matter which ran around the equator. This opacity was due to a destruction



PERINUCLERAL AND PUNCTATE CATARACT. (HESS.)
Grüfe's Archiv.

of one of the bands of connection with the cortex. The changes in the lens consisted in excessive shrinking and the formation of small drops and great spaces, that had no particular arrangement. From the study of five zonular cataracts, Hess, of Leipzig, ²⁰⁴ _{B.39, H.1} confirms Schirmer's theory that the agent producing the vacuolation acts upon both nucleus and cortical matter. The process doubtless affects the fibres first, but possibly in the beginning may be between them. The younger fibres suffer most, and as a result the zonular part of the lens becomes affected. In regard to the pathology of congenital cataracts, the author draws some hypothetical conclusions from the study of the eye of an embryonic chicken where the epithelial involution which forms the embryonic

lens had not been cut off from the epiblast, and the proliferating lens-fibres had consequently grown out through the unclosed opening. A condition like this might give rise to cataract, as the capsule would contain nothing but degenerated lens-fibres, the position of the opacity depending upon the time of closure of the capsule. In six cases of premature punctate senile cataracts, the author found the punctate opacities to be produced by elliptical spaces, either homogeneous or granular, in the otherwise normal perinuclear cortex. Beyond the clinical appearance of punctate opacities the acquired and the congenital forms have nothing in common. The illustration on preceding page shows the external configuration of this latter affection. A microscopic section through a zonular cataract (see plate) showed fine punctate massings in the equatorial portions of the cortex. Theobald, of Baltimore,⁷⁶⁵ May has obtained considerable improvement in vision by performing iridectomy in zonular cataract. The author thinks that if there be many rays of opacity running through the transparent zone of lens-matter iridectomy should not be made, but if the periphery of the lens is broad and free from opacity it may properly be performed. Gillet de Grandmont, of Paris,²⁷⁴ May has extracted a cataract that clinically presented an absolutely *black appearance* without the least striation. Hénocque studied the specimen with the spectroscope, and found that the spectrum was characterized by a general absorption that had its maximum in violet, blue, and dark red, and its minimum in green, yellow, and orange. The latter author concludes that the coloration of the cataract is due to the coloring matter of the blood produced from haematin; that it is quite different from the pigment of the choroid and is not due to melanin, but is produced by progressive imbibition, the parts nearest to the capsule being the more colored. Examination of the rest of the eye explained the pathogenesis of the cataract.

Snell, of Sheffield,² July 18 has suggested massage to aid in the process of absorption in *traumatic and soft cataracts*. If the opening in the capsule is at all free, in the latter variety, after needling, softened portions of the lens can often be massaged out of it into the anterior chamber. The procedure should not be adopted until the eye is tolerably free from irritation. In a series of cases of *immature cataract*, Jackson, of Philadelphia,⁷⁶ Sept. has resorted to artificial ripening by massage through the cornea after



Microscopical section through a Zonular Cataract (Hess).

Graefe's Archiv.

paracentesis without iridectomy, as suggested by Pooley, of New York, and practiced by White, of Richmond. In five cases in which the patients were over 50 years of age, maturity of the cataract occurred in periods of from two weeks' to three months' time, while in two cases under 35 years of age, in the practice of a colleague, no perceptible effect on the lenticular opacity was produced. The operation was followed by very little reaction. In all the cases successfully operated upon extraction had been uncomplicated, healing normal, and good vision had been obtained without a secondary operation. The author concludes that this method is more efficient than that of iridectomy with massage, that it is apparently free from danger, and that in many cases it is a better means of avoiding prolonged practical blindness than the extraction of immature cataracts. Bettman, of Chicago,⁷⁶ Sept. has practiced direct trituration of the lens without iridectomy in a series of cases of immature cataract, never observing unfavorable results. He considers it unsafe to perform extraction where the fundus-reflex can still be obtained, except in cases of complete sclerosis of the lens. In another paper¹⁰¹⁸ Jan. he reports three additional cases. Beaumont, of Bath,⁴¹ Feb. believes that the improvement which sometimes occurs in the progress of incipient cataract is due rather to a change in the index of refraction than to a clearing of the lens-substance. Where the periphery of the lens shows numerous fine striæ, the prognosis is favorable for retaining good vision. Neuberger, of Berlin,¹⁹⁰ Sept. has found that the liability to cataract-formation increases rapidly from the fiftieth to the eightieth year, after which it becomes less. Guenther, of Vienna,⁸ Nov., '92 has observed an instance of cataract in two sisters, aged 13 and 14 years, who were both idiotic and rachitic. In each case there was a history of convulsions occurring at 3 years of age. Bergmeister, of Vienna,⁸ Dec., '92 has seen stellate cataracts in thirteen members of the same family. Fromaget, of Bordeaux,⁷⁰ July 30 has been able to trace the influence of heredity in the production of cataract through six generations. In no instance was there any evidence of consanguinity. The transmission was effected by females alone. Frenkel, of Lyons,²¹¹ July 9 believes that cataracts are caused by a disorder of nutrition; that is to say, that they are a consequence of auto-intoxication by *toxins* in the organ, or by a failure in their proper elimination. He has examined 34 cases,

and in 33 instances found that the urine contained a co-efficient of toxic substances less than normal, whilst in but 1 instance was there an increase in these substances. Of the 33 cases, the urine of 13 contained less *toxins* than the lowest limit observed in ordinary pathological cases. The author concludes that the diminution in quantity of these toxic elements is so constant that one must admit the relation of cause and effect. Recke, of Breslau,¹⁹⁰ _{May} has carefully studied the earliest changes in a *cataract due to myopia*. In addition to globules, there were a number of water-clear rays, all of which were directed toward the centre of the lens. Later, these rays became granular.

Wescott, of Chicago,¹⁰¹⁸ _{Jan.} found the lens in an eye, removed on account of a penetrating wound, to be dislocated between the ocular conjunctiva and the sclera, where it had become encapsulated in a mass of inflammatory exudate. Warner, of Brooklyn,⁷⁷⁶ _{Jan.} has seen a case of dislocation of the lens, with subsequent formation of cataract, follow concussion of the ball from a shot which lodged between the conjunctiva and sclera. A case of persistent supra-orbital neuralgia, relieved by the extraction of a partially luxated cretaceous lens, is reported by Powers, of California. ⁷⁷ _{June}.

Schweigger, of Berlin, ⁴¹ _{May 25} has removed the lens fifteen times in cases of high myopia, with an improvement in the ocular condition of the patient. He does not think that iridectomy is necessary, and he removes the swollen lens-matter as soon as it causes irritation. Only those cases are fit for operation where the far point is situated at about seven centimetres from the eye.

Teale, of Leeds, ²² _{June 17} favors *extraction without iridectomy*. In making the section he employs a narrow Sichel knife. The puncture and counter-puncture are made just within the corneal margin. When the point has passed out of the wound for a distance of four millimetres, the blade is turned somewhat rapidly forward, at right angles to the back of the cornea, and made to cut its way out in a vertical direction midway between the horizontal equator and the upper margin of the cornea. The advantages claimed for this incision are: "1. In as far as it approaches the flap-operation, it possesses, with that operation, the advantage of extrusion of the cataract without any cutting of the iris. In as far as it approaches the linear, it obviates to a great extent the disadvantages of the flap, which were the great liability to serious

prolapse of the iris and to the displacement of the flap by the upper eyelid. 2. The position of the greater part of the incision, across the middle and not at the base of the iris, allows the lens more readily to present at the wound, as there is less of the body of the iris to be displaced. 3. The greater part of the wound being linear and vertical to the corneal thickness, as soon as the lens has escaped and all cortical matter has been removed, the wound closes absolutely, and fits, leaving a level surface, which permits early sealing of the aqueous chamber. 4. The greater part of the wound being away from the base of the iris, and rather toward the pupil, there is a remarkable facility for the escape, or rather the extrusion, of cortical portions of the lens. 5. The incision being entirely in the cornea, and away from the ciliary region, there is probably much less risk of iridocyclitis, or of subsequent glaucoma." In the *extraction of cataract without iridectomy*, Galezowski, of Paris,¹⁷³ makes a puncture upon the opaque border of the cornea, and, after he has incised the capsule with a knife, executes the counter-puncture. Discission with the knife is only performed when the lens is hard, as the soft cortical matter would otherwise get into the anterior chamber and obscure the field of operation. When the cataracts are soft or liquid, however, the cystotome is used. The author lays great stress upon the importance, in all instances, of having a sufficiently-large opening in the capsule. In order to avoid wounding the iris with the knife as it sweeps through the chamber, a slight obliquity is given to the semi-elliptical flap. By placing the point of the puncture and counter-puncture near the horizontal diameter and the sclerotic border, two to four millimetres can be gained in the size of the wound, which is of importance in the delivery of the lens. The iris is replaced by a small gold spatula. In order to avoid injury to the iris, the author is in the habit of performing a small sphincterectomy.

In the experience of Rivers, of Denver,¹ Mar. 18 the most serious objections to simple extraction are the difficulty met with in removing cortical substance and the almost invariable occurrence of iritis with the development of posterior synechia. Montgomery, of Chicago,⁸⁰ June 15 prefers simple extraction in all cases of uncomplicated cataract, performing an iridectomy only where the lens is not readily delivered and bruising of the iris has occurred. De

Wecker, of Paris, ²⁷⁴ Nov., '92 performs simple extraction in ripe senile cataracts, where the patient is healthy and obedient. If the cataract is unripe and the patient restless, with unfavorable hygienic surroundings, however, he advises the performance of an iridectomy, either at the time of the operation or preliminary to it. If the iris become entangled in the corneal wound, a faulty cicatrization takes place, which favors the entrance of germs into the eye; increased tension may also result. Both of these complications are less common after the simple operation, and secondary operations are more successful for their relief than where an iridectomy has been previously performed.

Hogg, of London, ²² July 12 states that a more extended experience tends to confirm his previously-expressed preference for simple extraction. Cant, of Lincoln, ² Oct. 16, '92 considers prolapse of the iris after simple extraction of but slight importance, provided it be excised within twenty-four hours after the operation. The patient should be anaesthetized, and the scissors should be held at right angles to the wound, so that the iris may be divided at one snip. Taylor, of Nottingham, ⁶ July 1; ²² July 5 prefers simple extraction. In making the section he employs a knife bent at an angle, so that the right hand may be used, in operating upon either eye, without a change of position of the operator. This has been accomplished by making such a bend in the shank of the instrument as to allow the handle to be freely moved over the bridge of the nose. His objections to the performance of an iridectomy are that it is the one step in the operation which provokes resistance on the part of the patient and invites disaster, while excision of the iris creates an inner and outer wound, thus exposing the ciliary body and thereby doubling the risk of infection; further, the haemorrhage, which sometimes fills the anterior chamber and seriously embarrasses the subsequent steps of the operation.

Keyser, of Philadelphia, ¹⁰⁰⁷ Mar. reports two cases in which prolapse of the iris occurred unusually late after simple extraction. Iridectomy was performed in the first instance fourteen days and in the second twelve days after the primary operation.

Galezowski, of Paris, ¹⁷³ Dec., '92 prefers the semi-elliptical flap without iridectomy. This is made by puncture and counter-puncture in the sclerotic border, midway between a horizontal line in the direction of the base of David's flap and one in the line of Graefe's

incision. The knife is then brought forward to a point two millimetres within the sclero-corneal junction. If the anterior chamber be large and the cataract hard, the capsule should be incised with the point of the knife before the counter-puncture is made; otherwise this procedure is effected in the second stage of the operation. The blepharostat is removed and the cataract is delivered by pressing with the thumb of the left hand on the lower lid, and with the ring-finger of the right hand on the upper lid. The author believes that all soft, traumatic, or complicated cataracts, produced either by local disease or constitutional affection, should be extracted with iridectomy. Eserine should be instilled into the eye after the operation. The author avoids secondary cataract by carefully removing all cortical matter. Should a secondary cataract result, he advises the avoidance of operative interference until at least six months after the primary operation. Von Hippel, of Halle,^{35 Sept. 5} only operates upon one eye in a single sitting. He excises a small piece of iris, and removes as large a piece of capsule as is possible with the capsule-forceps. After the operation is finished, a little iodoform is dusted on the wound and a bandage is applied, which is removed daily. In the third week after extraction, discussion of the capsule is performed with a broad Schweiger's needle. The author gives the statistics of 255 cataracts removed by him in the last three years; 96.4 per cent. were successful, while 2.4 per cent. were unsuccessful. In 0.4 per cent. vision could not be ascertained. Total loss of the eyes occurred in 0.8 per cent. Discussion of the posterior capsule was performed in 33 per cent. of the cases.

Swanzy, of Dublin,^{2 June 17} favors the combined operation in cataract extraction. Of 100 consecutive cases of uncomplicated senile cataract so treated, the results in 95 instances were good, in 2 medium, and in 3 unsuccessful, these 3 resulting from iritis. The author makes the coloboma three and a half millimetres wide, and exercises great care to prevent any tag or capsule remaining in that part of the wound corresponding to the colobomatous area. Fergus, of Glasgow,^{2 May 13} endeavors to make a two- or three-millimetre flap with the puncture and counter-puncture in the apparent corneal margin. After making the section, he opens the capsule by a T-incision, and then performs an iridectomy. In delivering the lens so as to prevent dangerous

pressure by the straining of the patient, he makes all manipulations by means of instruments, and allows the speculum to remain. As a rule, he does not instill either a mydriatic or myotic, and applies a very light dressing. In treating congenital cataract he divides both the capsule and the lens very freely, and allows the lenticular substance to macerate away freely for a few days, when a straight keratome is thrust through the cornea and the lens-matter is permitted to escape along its surface.

Esson, of New York,^{2139 Jan.} has reported ninety-four cataract extractions at the New York Eye and Ear Infirmary. Healing was complicated by mild iritis twenty-three times, by severe iritis seven times, and by superficial keratitis nine times. Panophthalmitis occurred once. Of sixty cases operated upon without iridectomy, incarceration and prolapse of the iris occurred eight times. In simple senile cataract the percentage of successes was 78.94 per cent., and of partial successes 3.5 per cent. In the complicated variety perfect success was obtained in 56 per cent., and partial success in 5 per cent. Cocaine was employed as the anæsthetic eighty-eight times, ether three times, chloroform twice, and ether and chloroform once.

De Wecker, of Paris,^{274 July} claims to have proved that the triangular flap employed by Daviel in cataract extraction was directed downward. He gives the latter the credit of introducing iridectomy, and thinks that the method of extracting the capsule practiced by Janin in 1791 has not been improved upon. In answer to the question raised by Dujardin as to whether the incision employed by Daviel in cataract extraction embraced more than half of the cornea, de Wecker, of Paris,^{274 May} replies that the section was usually made through the horizontal diameter of the cornea or a little above it.

Albrand, of Berlin,^{254 Apr.} gives the statistics of 549 cataract operations performed by Schoeler during the past six years. Of this number, 232 were operated upon by iridectomy, 317 without. Atropia was used in many cases after the first bandage was removed, on the fourth day, the only indication against its employment being secondary glaucoma or possibly "thread-like keratitis." Of the 232 cases performed with iridectomy, three eyes were lost by suppuration after the operation. Iritis was observed six times, and glaucomatous symptoms occurred seven times. In seven

instances discussion of the secondary cataract was necessary from three to four weeks after the primary operation. In those eyes operated upon by the simple method, prolapse of the vitreous and iritis occurred nine times. Glaucomatous symptoms were seen in but five eyes. The iris prolapsed in twenty instances, and discussion of secondary opacities was performed forty-five times. Disease of the general system was not found to be a contra-indication to the performance of cataract extractions. Inasmuch as germs are readily carried from the edge of the lid to the globe, Bernheim, of Zurich, ²¹⁴ _{Aug. 1} cautions against the delivery of cataracts by the application of the lid against the cornea. The author has found tears to have the power of diminishing the number of the staphylococcus pyogenes aureus and the bacillus subtilis. Their virulence, however, was not affected. The gonococcus and micrococcus prodigiosus were unchanged. In cataract operations where difficulty is experienced in removing the lens after it has engaged in the wound, Howe, of Buffalo, ⁷⁶ _{Sept.} resorts to suction, employing for the purpose a glass tube resembling a dropping pipette, the end of which is dilated into a very thin oval, shaped to fit the edges of the projecting lens. The vacuum is produced by suction with the mouth through a flexible rubber tube. Murrell, of St. Louis, ¹⁰⁰⁷ _{Oct., '92} states that the lids are the natural splint to the eye, and no other dressing can avail anything beyond that necessary to maintain them in easy juxtaposition. This is best done by a strip of isinglass, gelatole plaster, or gold-beater's skin, extending from the outer surface of one lid to the other. The dressing should not be disturbed without cause until healing is perfect. It is unnecessary to close the unoperated eye. It is safe to perform extraction in the surgeon's office, and to send the patient home within visiting distance of the operator. It is not necessary to confine the patient to bed, or to darken the room beyond excluding any disagreeable light. Fluid vitreous, dislocation of the lens, and simple extraction are no contradictions to the foregoing rules.

Lopez, of Havana, ⁴⁵¹ _{May} gives notes of three cases of *delirium following cataract extraction*. In the first instance the patient was addicted to the moderate use of alcohol, in the second there was a history of family mental disease, whilst in the third there was a history of melancholia. Atheroma was present in each instance. The author believes that the delirium consequent upon

operations is only a form of mania in individuals already mentally alienated, or in whom the intellectual trouble is latent; further, that atheroma is an important factor in the causation of cerebral disease and of maniacal paroxysms. De Schweinitz, of Philadelphia,^{1018 Apr.} cites an instance of dementia following cataract extraction, in a man 59 years of age, who had suffered much mental anxiety. There was organic cardiac disease, and the urine contained albumen and casts. He is of the opinion that mania or dementia after operations is more apt to occur in individuals whose mental balance is not entirely secure before the operation. Sous, of Bordeaux,^{188 Sept. 17} has found that the quantity of urea excreted increases gradually after cataract extraction up to the third day; that it slowly diminishes until about the eighth day, when the quantity is about the same as prior to the operation.

Trousseau, of Paris,^{171 Jan.} does not hesitate to perform extraction of cataract in eyes affected with pterygium. He avoids any possible harmful effect by making the corneal incision in such a way that the growths remain undisturbed. Ziegler, of Philadelphia,^{760 Nov. 12, '92} reports a case of *cataract secondary to repeated haemorrhages from the ciliary body*. The patient was a woman, 21 years of age, who suffered from obstinate constipation following dysentery. Extraction was performed and, although acute glaucomatous symptoms supervened upon the performance of a capsulotomy for secondary cataract, the eye recovered with almost normal vision. In a case of cataract secondary to gumma of the iris, in which de Schweinitz, of Philadelphia,^{1018 Apr.} had successfully performed extraction after a preliminary iridectomy, glaucomatous symptoms supervened, upon the use of atropine. Owing to the appearance of a spot of infiltration in the cornea, and to allay pain, the drug had been instilled the day previously. The case made a good recovery, under the use of eserine and cocaine locally, and inunctions of mercury with full doses of chloral.

Dunn, of Richmond,^{1018 July} cites three instances of dislocation of the lens during operation. In the third case the lens was dislocated upward behind the iris, and half the vitreous was lost. An iridectomy was made, and the lens removed with a hook. The eye, which had collapsed to one-half its normal size, was bandaged, and upon the seventh day was found to have acquired its natural shape. Hamilton, of South Australia,^{267 Dec. 15, '92} has successfully removed

a spontaneously dislocated calcareous lens from the anterior chamber of a highly myopic eye. Jackson, of Philadelphia,^{19_{Apr. 8}} reports two cases of cataract extraction, followed by purulent conjunctivitis which did not affect the course of healing in either case. Hirschberg, of Berlin,^{190_{Aug.}} has extracted zonular cataracts from four patients over 40 years of age. In one instance this form of opacity was present in grandmother, mother, and child. Mitvalsky, of Prague,^{190_{Oct., '92}} reports two additional cases of spontaneous cure of complete senile cataract by intra-capsular absorption. In both instances one eye had been operated on previously for cataract. In the majority of the reported cases, the change in the cataractous lens consisted apparently in the cortical layers becoming fluid. These layers, undergoing absorption, generally left an opaque nucleus of variable size, which sank to the lower part of the capsule. In a case of slowly-absorbing lens-substance, previously reported by Theobald, of Baltimore (ANNUAL, 1892),^{76_{Sept.}} after a long period of quiescence, a triangular piece of lens-matter appeared in the anterior chamber and excited considerable irritation. After remaining under observation for two months—in which time no change in its volume occurred—it was returned to the vitreous chamber by dilating the pupil and by manipulation.

A case is reported by Chevallereau, of Paris,¹⁵² in which, seven months after cataract extraction, two cysts of the iris appeared. These, by closing the pupillary area, necessitated removal. He believes that such cysts arise by a portion of epithelium being carried from the anterior portion of the cornea to the iris, where they develop either into squamous epitheliomata or epithelial cysts. Smith, of Chattanooga,^{76_{Sept.}} has successfully removed a cataractous lens from a patient reputed to have been 116 years of age. Normal acuity of vision was obtained.

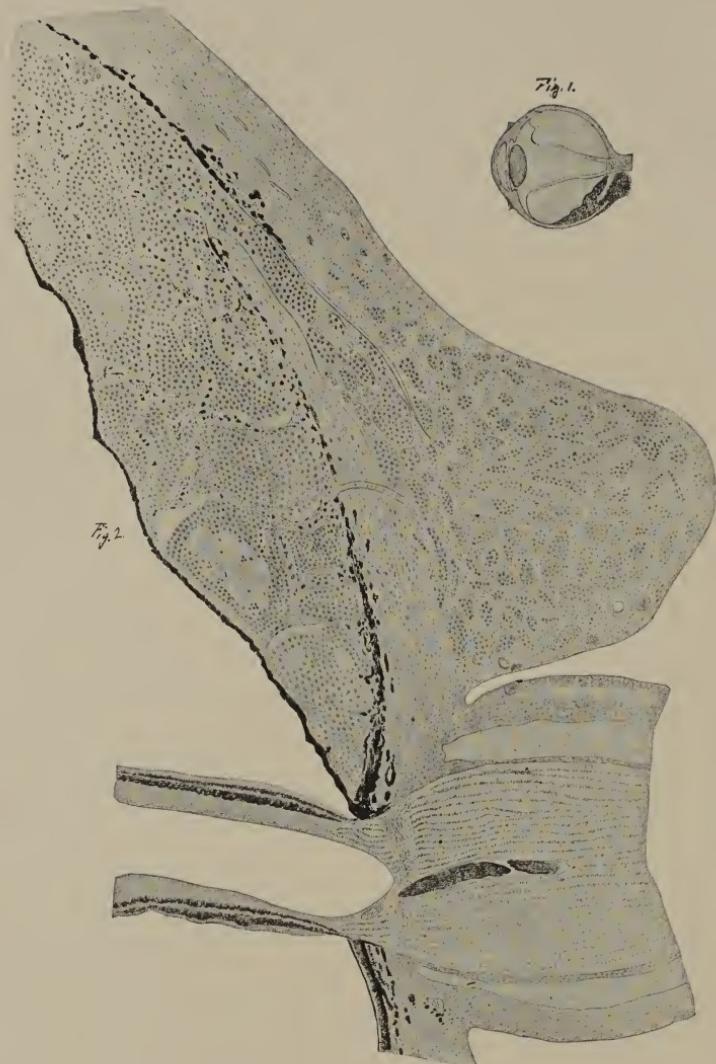
DISEASES OF THE CHOROID.

Sous,^{188_{Nov. 20}} has seen an instance of *choroiditis and keratitis* where the ocular symptoms were manifestly due to the removal of the filling from a right superior molar. The case, a young woman 21 years old, was of lymphatic constitution, but in perfect health. The vision of the affected eye was reduced to $\frac{1}{10}$, and the amplitude of accommodation was much diminished. Both conditions returned to normal after the dental affection was cared for. The

author explains the case by the reflex action of the superior maxillary nerve upon the ophthalmic branch of Willis.

Gradle, of Chicago,^{1018 Jan.} has observed three cases of "central circumscribed chorio-retinitis." The presence of the essential features in all three instances led him to consider the affection as a typical and distinct form of inflammation. The ophthalmoscope revealed an irregularly-shaped, chalky-white spot, about one-sixth to one-third the size of the optic disc, situated between the papilla and macula. This plaque was not raised above the plane of the normal retina. There were also small foci of infiltration adjoining. In advance of the affected area a transparent reflecting membrane, close to the membrana limitans, could be seen in the vitreous. There was evidence of diffuse disease of the uvea, such as des-cemetitis and iritis. Visual acuity was greatly diminished and a relative central scotoma persisted. None of the patients had syphilis. In one the removal of a carious tooth and the treatment of a resulting abscess of the antrum were followed by an immediate clearing of the cornea and vitreous. The author suggests that an infectious embolus might produce such an inflammation. Darier, of Paris,^{171 Mar.} has cured a case of *central choroiditis*, in which vision was nearly lost, by the use of subconjunctival injections of bichloride of mercury. Inunctions of mercury and the iodides had been used without avail. Scheidemann, of Berlin,^{190 Sept.} has observed an instance of acute, central, exudative chorio-retinitis in which sight rapidly improved upon the subconjunctival injection of mercury after inunctions of the same drug had failed.

Two cases of chronic septic choroiditis—one occurring after typhoid fever, the other without apparent cause—are reported by du Gourlay, of Dinard.^{171 Oct. '92} In one case enucleation was performed without any general complication; in the other meningitis followed the operation, and death ensued after one month of apparent health. The first case was operated on early, while the second was untouched until the disease was of three months' standing. To prevent dissemination to the meninges, early operation is considered essential in the insidious forms of panophthalmitis. Webster, of New York, and Schwartzschild, of New York,^{347 Apr.} have studied, both clinically and pathologically, a case of metastatic exudative muco-purulent chorio-retinitis, with complications following remittent fever, in which the fellow-eye showed symptoms



Metastatic Carcinoma of the Choroid (Shultze).

Fig. 1, Macroscopical section.

Fig. 2, Microscopical section.

Archiv für Augenheilkunde.

of sympathetic irritation. Removal of the exciting eye was followed by complete recovery of the sympathizing one. Schwartzschild believes that the sympathetic affection was caused by the traction of the inflammatory exudate upon the ciliary processes, and that the disease is a neurosis of reflex origin. In this case there was no embolus to create suppuration, but a haemic change existed, which caused the vascular walls to undergo retrogression. Chilton, of Dallas,⁸¹ condemns all attempts at saving an eye affected by traumatic suppurative choroiditis. Bull, of New York,^{1018 Apr.} records two cases of *gonorrhœal irido-choroiditis*. In one instance the attack manifested itself on the eighth day, and in the second upon the fourth day after the appearance of the urethral discharge, subsequent to the occurrence of an arthritis. Both cases made good recoveries under the administration of large doses of salicylate of sodium and cinchonidia, potassium iodide, and appropriate local treatment.

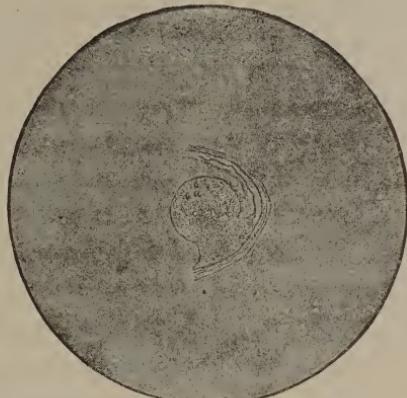
Two cases of complete detachment of the choroid have been recorded by Mules, of Manchester.^{76 May} The first was a boy 12 years of age, and no cause could be assigned for the condition. The eyeball was enucleated. In the second case, which occurred in a youth aged 19 years, the eye had been injured by a thrust with the finger. According to the author, the cases differ from those previously reported in that in the first the vascular system of the choroid could not be seen, although the media were clear, and in the second the choroidal vessels were at first visible, but were afterward obscured by lymph. Lawford, of London,^{2 Oct. 15, '92} is of the opinion that all primary intra-ocular growths do not belong to the group of sarcoma, but that a certain number are, in reality, carcinomatous in character. Kamocki, of Warsaw,^{254 July} describes an instance of metastatic adenocarcinoma of the choroid, where the primary growth was probably seated in the stomach. The accompanying plate gives the gross and the macroscopical appearance of a case of metastatic carcinoma of the choroid that has been seen by Schultze.²⁵⁴ Microscopically, the growth was a cysto-adenoma, its glandular character being well marked.

Fromaget, of Bordeaux,^{70 Aug. 20} has observed, clinically and pathologically, an instance of leucosarcoma of the choroid that had apparently developed from the lamina fusca. It was composed of two distinct lobes of unequal size. Microscopically, it was

remarkable on account of the huge vascular spaces that permeated it in all directions. The author is inclined to think that atropine, which was dropped into the eye the better to examine that organ, gave rise to an increase in the arterial spaces of the tumor, rupturing and precipitating an attack of acute glaucoma, which had necessitated enucleation of the eye.

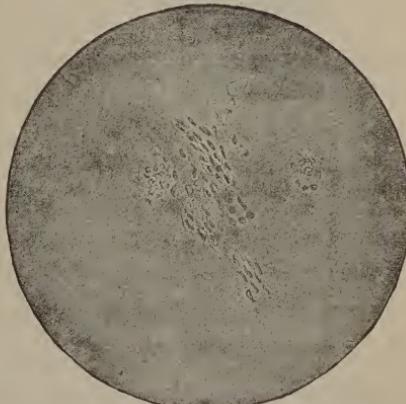
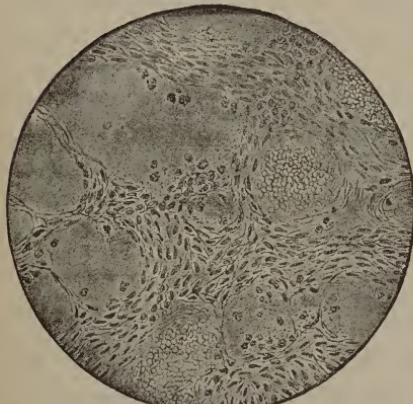
Holden, of New York,^{249 Oct., '92} has made a microscopical study of a case of *sarcoma of the choroid* and ciliary body in an eye enucleated by Webster. The growth was found to consist of two masses with a common base,—the one springing from the choroid, the other from the ciliary body. The choroidal portion was covered by a capsule consisting of retinal pigment-epithelium, lamina vitræ, and chorio-capillaris, and was but slightly mottled; while the ciliary portion, which was uncovered, was darkly and diffusely pigmented. Sections bleached after the method of Treacher Collins showed that the shape, size, and arrangement of the cells were the same in both tumors. The pathological process was found to have extended into the loose tissue of the ligamentum pectinatum and the head of the ciliary body throughout the entire circumference of the cornea. Oliver, of Philadelphia,^{76 Sept.} has seen a case of *spindle-celled sarcoma of the choroid* in the left eye of a man 34 years of age. Two years previous to coming under observation the growth had been detected by another surgeon, but operative interference had been refused. Later, the patient suffered from exacerbations of intense neuralgia, more marked on the left side, which had rendered him morose, irritable, and unmanageable at times. At this period he several times lost the power of counting money and of performing arithmetical problems. When first seen by the author a yellowish-red vascular growth, springing from the outer portion of the choroid and extending forward, downward, and inward in the vitreous to a point immediately behind the lens was apparent. The deeper-lying vessels of the growth itself could be seen underlying, in many places, those of the superimposed retina. The vitreous was fluid. The central retinal vessels were everywhere tortuous, the inferior nasal branch being quite large. Vision was absolutely lost. Physical examination of the patient showed slight enlargement of the spleen and liver. The eye was enucleated, and the growth was found to spring from the outer layer of the choroid. Microscopical examination showed it to be a

spindle-celled sarcoma. The cells, which were small, quite uniform in size, and containing oval vesicular nuclei, ran in bundles. Throughout the growth numerous cavernous sinuses containing red blood-corpuscles could be recognized. A second variety of



MACROSCOPICAL APPEARANCE OF SPINDLE-CELLED SARCOMA OF THE CHOROID. (OLIVER.)
Ophthalmic Review.

sinuses could be made out which, although similar to the blood-channels, were unconnected with them. These contained large round pigment cells. These sinuses represented cavernous lymph-spaces, and the cells were probably leucocytes containing pigment



MICROSCOPICAL APPEARANCE OF THE GROWTH. (OLIVER.)
Ophthalmic Review.

obtained from the interstices of the tissues. The accompanying sketches show these conditions very well.

Gruening, of New York,⁷⁶ has seen a case of sarcoma of the choroid in a woman 30 years of age. The ophthalmoscope showed

a bluish-gray prominence having a diameter of about four times that of the disc, and situated at a distance of two discs' diameter from the papilla. The apex of the growth was best seen with a + 10 dioptrē and the fundus level with a — 10 dioptrē. The retinal vessels passed uninterruptedly across the elevated area, and vessels of new formation, of equal calibre throughout, were observed anastomosing freely. Section of the globe showed a choroidal sarcoma, springing from the region of the macula. A case of melanotic sarcoma of the choroid of the left eye is reported by White, of Richmond.⁷⁶ The eyeball was displaced, and showed a large black pigment-spot above and to the outer side of the cornea. Enucleation was performed; microscopical examination proved that the growth had not penetrated the sclerotic. Barck, of St. Louis,³⁶⁴ gives the notes of a case of similar tumor of the

choroid in the left eye of a woman 53 years of age. When seen by the author, the disease had existed for about one year. The growth had penetrated the sclerotic and had involved the periosteum of the orbit. In operating for its removal, portions of the superior maxillary, ethmoid, and bony walls of the orbit surrounding the foramen and superior fissure were removed.

SARCOMA OF CHOROID. (RODERMUND.)

Chicago Medical Times.

The patient died of acute leptomeningitis, involving the left parietal and temporal lobes. The accompanying illustration represents a section of an eye enucleated by Rodermund, of Appleton,¹⁹² for sarcoma of the choroid.

DISEASES OF THE VITREOUS.

Jaenner, of Vienna, has found that *congenital band-like formations* in the vitreous may be caused by (1) a patulous or a closed hyaloid artery; (2) the visibility of the canal of Cloquet; (3) the visibility of the canal of Cloquet, with remains of the hyaloid artery. The author reports a case which he is inclined to place under the second class. As an aid to the diagnosis between *true cylindrical encapsulated cysticerci* in the vitreous and the remnants of a *persistent hyaloid artery*, Hirschberg, of Berlin,¹⁹⁰

suggests the following points: 1. The color of the iris in the congenital disturbance is lighter. 2. The tube is blue, and reaches from the papilla to the posterior pole of the lens. In the persistent artery also there are usually pigment changes in the fundus, and numerous fine processes reach from the tube to the retina, while vision is poor. The same author ^{Aug. 14}⁵⁰ has successfully removed a cysticercus from the vitreous by sclerotomy; the patient probably had contracted the disease two years before by eating affected pork.

The accompanying cut represents the post-mortem appearance of a subretinal cysticercus, found in the left eye of a five-year-old boy, seen in the practice of Schöbl, of Prague. ^{Apr.}¹⁹⁰

Malgat, of Nice, ^{May}¹⁷³ has observed an instance of *filaria* in a healthy young man, 21 years old, who lived in the Maritime Alps, and who had never left that part of the country. Upon direct examination, the parasite was seen suspended in the vitreous. It was apparently two centimetres long and about the size of a black hair. Except at its point of fixation above, which was superior to the level of the superior portion of the optic disc, it was quite mobile, especially with ocular movements. When the globe was perfectly immobile, the filament executed spontaneous and voluntary varied movements. The optic nerve was atrophic. On account of the ignorance of the patient, no data as to the entrance of the parasite into his body could be gathered. Beaumont, of Bath, ^{Dec., '92}⁷⁶ reports a case of *haemorrhage into the vitreous* in a man, aged 23 years, subject to frequent attacks of epistaxis. The heart was apparently normal, and there was never any tendency toward constipation.

By the aid of the electro-magnet, Thompson, of Cardiff, ^{Mar. 18}² has successfully removed a piece of steel measuring eleven by two millimetres from the vitreous humor. It had penetrated the lid almost at right angles to the surface, but was found standing vertically in the vitreous, with its long axis nearly parallel to the surface of the lid. The foreign substance had been in the eye for two weeks' time, and had given the patient no inconvenience. Green, of Grand Rapids, ^{July}¹⁸⁵ protests against the enucleation of eyeballs with foreign



CYSTICERCUS. (SCHÖBL.)
*Centralblatt für praktische
Augenheilkunde.*

bodies in the vitreous before making an attempt at extracting the foreign substances. Where possible, it is safer to remove a foreign body through the anterior chamber than through a sclerotic incision, as the latter procedure will cause detachment of the retina. Ayres, of Cincinnati,^{226 Aug.} cites two instances of unsuccessful attempts at removal of metallic foreign bodies from the vitreous by means of the electro-magnet. In one case the foreign substance was surrounded by coagulated blood, and in the other it had become imbedded so firmly in the sclera that the magnet failed to remove it. Briggs, of Sacramento,^{149 Apr.} records two recent cases of successful extraction of a piece of steel from the vitreous by means of a magnet, with recovery of "perfect vision."

DISEASES OF THE RETINA.

From a study of five cases of *embolism of a branch of the central artery of the retina*, Holden, of New York,^{249 Jan.} concludes that "with a single embolism of a branch of the central retinal artery we may have a field of quite irregular form, which, to a considerable extent, may be explained by the variation of arterial distribution; and in cases where the lumen of an artery remains blocked we may have a collateral restoration of its circulation by anastomosing vessels." A case of embolism of the central artery of the retina of the left eye associated with mitral stenosis and regurgitation has been observed by Foster, of Denver,^{249 Oct., '92} in a man 29 years of age. After subsidence of the effusion, silver-like lines and reddish mottling remained around the macular region. Jaesche, of Dorpat,^{254 July} reports an instance of the same affection with partial recovery of vision and the formation of a sclerotic patch in the retina. There were no signs of heart disease. The author believes that a thrombus, consisting of white blood-cells which did not completely obliterate its lumen, formed in the artery. The ophthalmoscopic appearances are well shown in the accompanying plate.

Pockley, of Sydney,^{267 Dec. 15, '92} gives notes of a similar case occurring in the left eye, in which a similar lesion had destroyed the sight in the fellow-eye eighteen months previously. The patient was a man, 62 years of age, suffering from simple hypertrophy of the heart.

The accompanying illustration represents a case of *retinitis proliferans* which was seen by von Hippel, of Königsberg,^{353 Nov., '92} in

Fig.1.



Fig.2.



Fig.3.

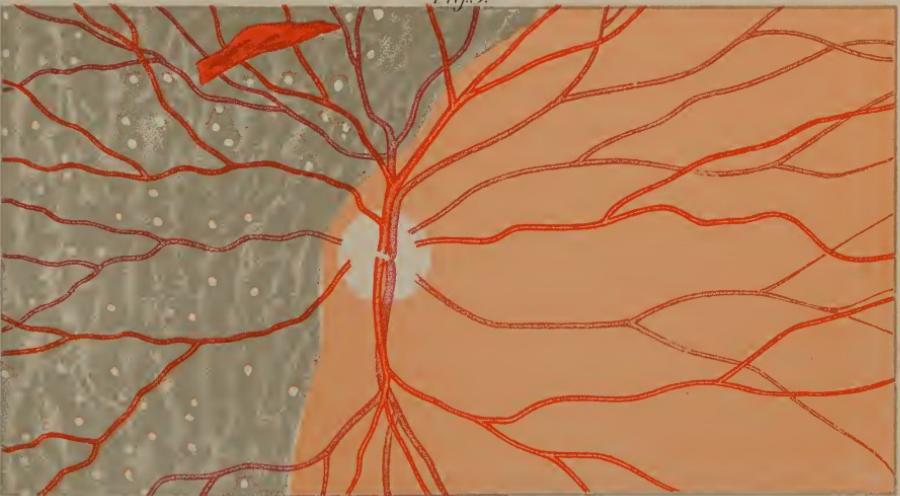


Fig.1 & 2 Embolisms of central artery of retina (Jaesche).
Fig.3 Peculiar appearance in a case of detached retina (Jaesche).



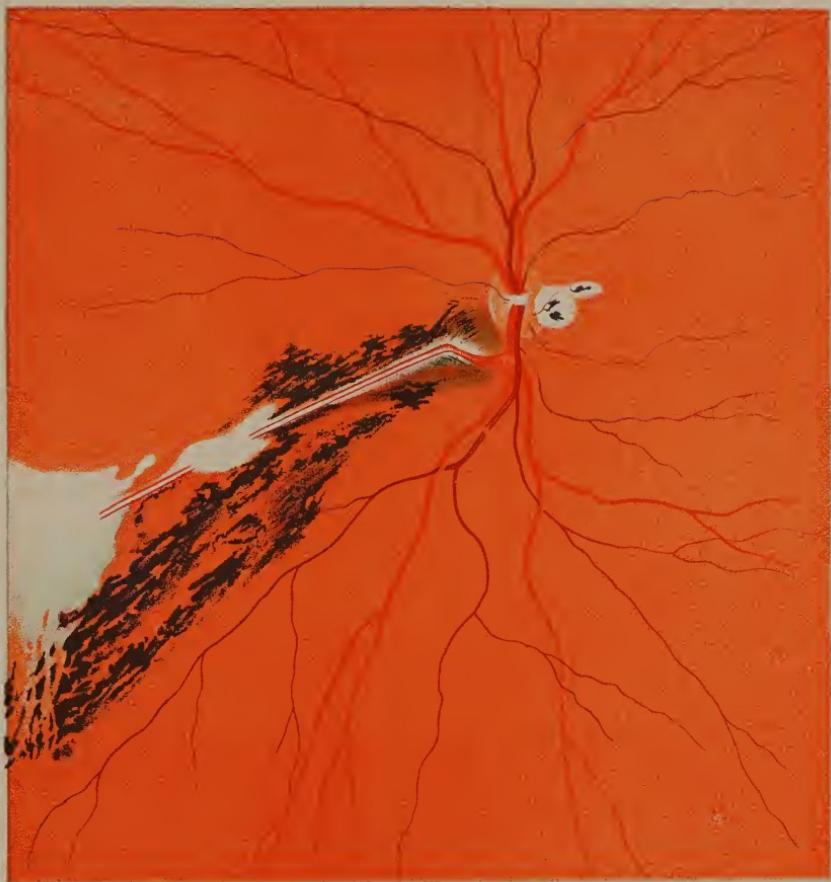
Retinitis Proliferans (Königsberg).
Archiv für Augenheilkunde.

a woman aged 36 years. The peripheral site of the degeneration, and the fact that there was no haemorrhage that could give rise to the condition, were the interesting points in the case. The author thinks that associated retinal changes might suggest a new etiology for the affection. In connection with the pathological anatomy and pathogenesis, Banholzer, of Zurich, ²⁵⁴ Oct., 192 reports the case of a woman, 59 years old, who received a severe blow on the eye. There was a moderate degree of haemorrhage into the vitreous and retina. Six months after the accident the ophthalmoscope revealed a bright prominent ring around the disc, with numerous bands and processes going off from it. A microscopical examination showed that these were composed of proliferating radiating fibres and newly-formed connective-tissue material, the result of a growth limited to the inner surface of the retina. The internal limiting membrane was also much altered, forming a thin layer, which was doubled over. At the point where this increase in growth had occurred, there was also a thin, narrow retinal fold. All of this tissue was surrounded by a membrane similar to the elastic capsule of the lens. The author thinks that the tissue lying on the limitans interna originated in the haemorrhages in the neighboring parts of the retina, whilst the surrounding membrane was doubtless the limitans interna, the folding of the retina being caused by traction through shrinking of the tissues. The retinal vessels, except one large one below the disc, in his specimens, ran under this tissue. In regard to the part played by the vitreous in the production of this condition, extensive growths of Mueller's fibres may occur, without any connection with changes in the vitreous.

Schultze, of Frankford, ²⁵⁴ Oct., 192 has seen two instances of retinitis proliferans, from which he concludes that there is usually a history of preceding vitreous haemorrhage. The resulting clots, being in a measure absorbed, become attached to the retina and can subsequently cause a partial growth of the connective-tissue frame-work of that membrane. The change of the mass of blood-fibrin into connective tissue is still questionable. The present name of the affection is a misnomer, as an inflammation of the retina has never been seen as a casual or as an accompanying factor. The first case observed by him differed from those already described, by the presence of new-formed blood-vessels in the vitreous. The second

instance occurred in a young man of good health who had suffered for some time from epistaxis. He was able in this case to trace the origin of the membranous formation to previous retinal and vitreous haemorrhages.

The accompanying lithograph gives the ophthalmoscopical picture of a *retinal rupture*, with connective-tissue formation in the retina and vitreous (*retinitis proliferans*, Manz), as seen by Axenfeld, of Marburg.²⁵⁴ This condition occurred in a woman, 33 years old, whose menstrual periods were irregular. The examination of the urine for albumen was negative. The ophthalmoscope revealed the new formation in the vitreous, partly obscuring the optic nerve. To the nasal side of the disc there was an atrophic, markedly pigmented spot in the choroid. A fold of the retina containing a good-sized branch of the retinal arteries and veins jutted out from the surface of the retina and projected into the vitreous, where it joined a large membranous body, which was best seen with 12 dioptres. In the left eye there was a large detachment of the retina below, and a new formation in the vitreous provided with retinal vessels which partly obscured the disc. The author believes this proliferating tissue to originate in unabsorbed haemorrhages, but considers their origin, in this instance, to have been due to an isolated detachment of a small strip of retina which was provided with blood-vessels; a previous haemorrhage into the retina became organized and made traction on this strip of retina, resulting in a rupture of that membrane, followed by an adhesive inflammation of the retina and choroid at the point of rupture, which gave rise to the pigmentation. Elschnig, of Grätz,²⁵¹ reports two cases as confirming his theory of the origin of retinal rupture in detachments of that membrane. The first case, a young man, had received a blow on the eye which seriously impaired his vision. After the subsidence of the acute symptoms, the ophthalmoscope revealed numerous haemorrhages in the retina and a flat retinal detachment in the periphery, which corresponded to the site of the external wound. Vitreous opacities seemed to be connected with the detachment. No rupture of the retina could be seen. Three weeks later, after all irritation of an irido-choroidal nature had subsided, the detachment suddenly increased after violent exercise. The ophthalmoscope now revealed a well-marked rupture in the retina. As there was no trace of connective tissue in the vitreous,



Rupture of the Retina
in a case of Retinitis Proliferans (Axenfeld).
Archiv für Augenheilkunde.

the author explains the condition by the fact that, the retina becoming glued down to the choroid at the macula by the inflammation, which was quite intense at that point, a funnel-shaped depression was formed, which finally gave way to the pressure exerted by the detachment, causing the rupture in the retina. The second instance was that of a woman aged 54 years. Sight had been gradually failing as a result of irido-choroiditis. The ophthalmoscope revealed an irregularly-shaped defect in the retina, through which, as in the former case, choroidal pigment could be seen.

Boucheron, of Paris,²⁷⁴ Feb. believes that retinæ detached by traumatism or myopia may be cured, if operated upon before the sixteenth day following the accident. He reports eight cases, all of which were cured. He makes use of keratotomy with or without iridectomy. In regard to the mechanism of the cure, every operation which evacuates the aqueous humor, and especially that which maintains this condition (every operation, therefore, which produces an hypotony,—that is, a little less resistance in the chamber of the aqueous humor), determines a dialytic current coming from the exudate accumulated at the exterior of the retina, the epithelial membrane of the detached process, and the vitreous. The dialyzing membrane is formed by this fine epithelial layer. The tendency to dialysis is the stronger the more marked the hypertony, for, when decreased tension exists, there is much less disposition to dialysis. On this account operation should be practiced during the short stage of hypertony. Raehlmann, of Dorpat,²⁵⁴ July believes that detachment of the retina is produced by a process of diffusion in the intra-ocular fluids, and not by a primary shrinkage of the vitreous humor. There are lymph-spaces in the retina analogous to those found elsewhere in the body, and individuals who are liable to suffer from œdema, such as albuminurics, occasionally have detached retina. A chemical change in the fluid of the vitreous—the nature of which is unknown—causes the fluid to become serous in its passage from the vitreous to the choroid, this condition being favored by a fluid vitreous and a pathological condition in the choroid. The shrinking of the vitreous may therefore be regarded as a correlated process, and tear in the retina as secondary.

Hirschberg, of Berlin,¹⁹⁰ Mar. has succeeded in curing a retinal detachment in a myopic eye by the extraction of a cataractous

lens. During an observation extending over twelve years the vision was found to have appreciably improved. De Schweinitz, of Philadelphia,⁸⁰ Jan. accords first place to hypodermatic injections of pilocarpine, and second to puncture of the sclera. Hirschberg¹⁹⁰ Apr. has seen an instance of green vision in a man, aged 33 years, who had a detached retina in the macular region. Six weeks after the commencement of the disease all objects became violet in tint. Jaesche, of Dorpat,²⁵⁴ July has seen a peculiar case of detached retina where the retina was wrinkled into many uneven folds. These folds were covered by numerous white, glistening points and lines. There was also a large, fresh tear in the retina which was crossed by some of the retinal vessels. Bourgeois, of Reims,⁵⁷⁷ Dec., '92 proposes a new operation in the treatment of this disorder. In cases of not more than eight days' standing, where the detachment does not involve more than one-quarter of the entire surface of the retina, and the macula is unaffected, he cauterizes the scleral tissue corresponding to the site of the detachment with the point of a thermo-cautery. The points of the instrument are applied, about two millimetres apart, over a rectangular space comprising the area of detachment. Atropia is instilled after the operation, and the patient is placed in bed.

A case of *retinal haemorrhage into the macular region*, occurring on the eighth day of a severe attack of haematuric, biliary, intermittent fever, is reported by Gazis, of Athens.¹⁷³ Jan. There was a complete central scotoma, and the blood could be freely seen with the ophthalmoscope. The haemorrhage was supposed to be due to obstruction of the capillaries, as it occurs in the kidneys in grave malarial fevers. A case of subhyaloid retinal haemorrhage is reported by Spicer.⁴²³ (See plate.)

Hotz, of Chicago,¹⁰¹⁸ Jan. records three cases of "blood effusions between the retina and vitreous body." In two the haemorrhage occurred in females, one suffering from suppression of the menses, the other from disturbance of the circulatory system attending chronic bronchitis and dyspepsia. The third case occurred in an apparently healthy man. In all three instances the blood became absorbed and sight was restored. Marple⁵⁹ Mar. 11 has seen an apparently typical case of *albuminuric retinitis* of one eye, in a woman 21 years of age, where repeated examination of the urine failed to reveal any albumen or casts. The author concludes as follows:

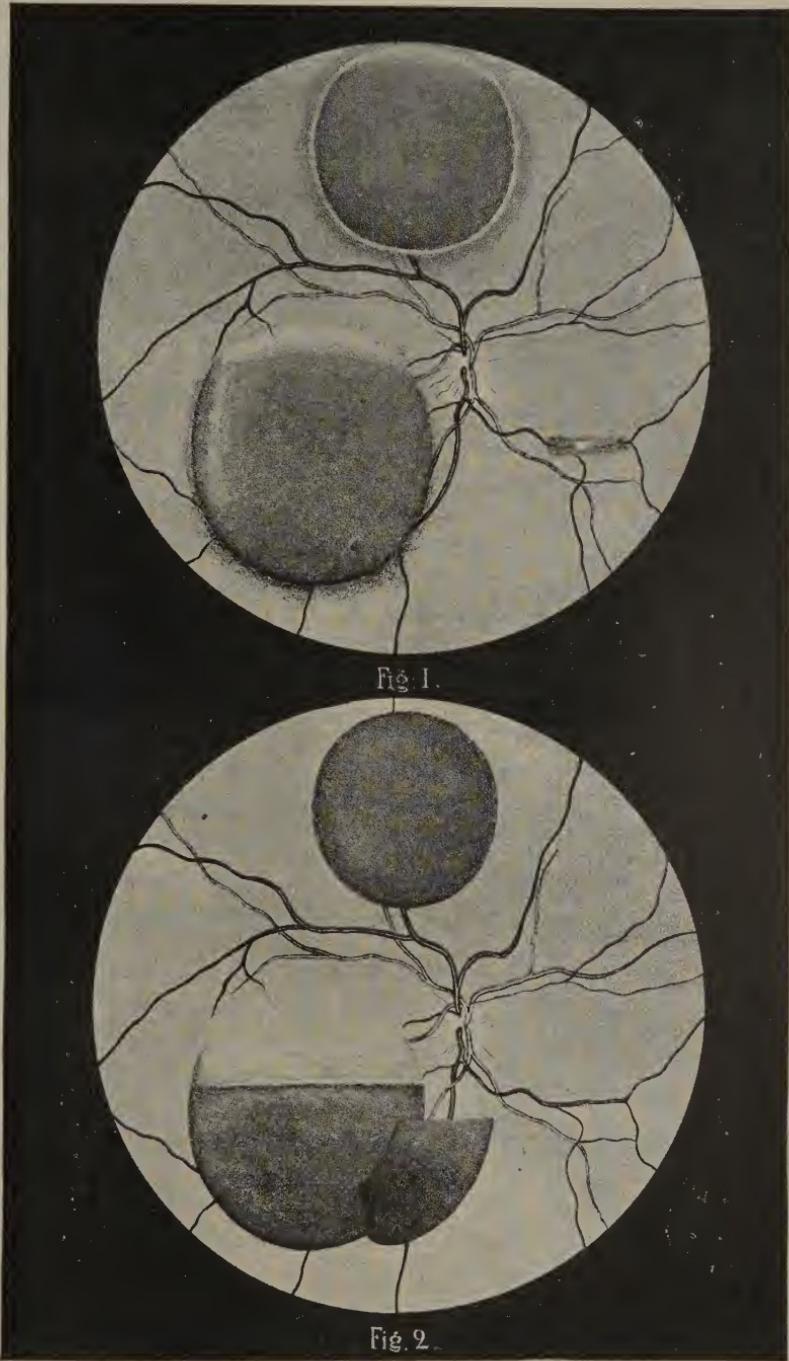


Fig. 1.

Fig. 2.

Sub-Hyaloid Retinal Haemorrhages (Spicer).

Royal London Ophthalmic Hospital Reports.

"1. According to the testimony of most observers, unilateral neuro-retinitis of Bright's disease, even where it remains unilateral for only a short time, is of rare occurrence. Cases which remain for months or years with only one eye involved are excessively rare. 2. Where the affection comes on in a few hours, as after an injury, or remains limited to one eye for months or years, as in chronic renal disease, the ordinarily accepted theories as to its causation seem inadequate. A satisfactory explanation of such cases seems difficult, if not impossible."

Saundby, of Birmingham, ³² Jan., Feb. distinguishes as follows the *retinitis of diabetes* from that of Bright's disease: "1. The patches are irregularly distributed around the centre of the retina, not specially near the macula, and are met with on the nasal as well as on the temporal side of the disc. 2. The patches are never arranged in a fan shape. 3. They are never associated with papillitis or diffuse retinitis. 4. The haemorrhages are, as a rule, punctiform, and not striated. 5. Haemorrhages into the vitreous are common." Bull, of New York, ¹ Aug., ¹² has made a careful study of five cases of *gouty retinitis and neuro-retinitis*, and has embodied his results in the following conclusions: "1. The changes in the fundus are always bilateral, though rarely symmetrical in the two eyes. 2. The degeneration in the walls of the blood-vessels and in the retina cause marked impairment of central vision, little or no loss of peripheral vision, and never end in blindness. 3. The loss of central vision is always progressive up to a certain point, unless the cause of the lesion is recognized early in the onset and immediately and properly handled. Improvement in the vision after the disease is established cannot be expected. 4. Haemorrhages into the retina are rare except in the early stage of the disease. Their absence later is probably due to the fact that the strength of the vascular walls is increased by the deposit, though their elasticity is diminished. 5. The most marked feature in the fundus is the development of arterio-sclerosis and phlebo-sclerosis. This is seen by the ophthalmoscope in the vessels of the retina, and the microscope shows that the degeneration exists as well in the vessels of the choroid and optic nerve. 6. Another almost equally pathognomonic symptom is the peculiar, yellowish, granular exudation in the retina, located by the ophthalmoscope around the posterior pole of the eye and generally

leaving the macula intact, and proved by the microscope to be mainly in the nerve-fibre layer, though found in all the layers except that of the rods and cones. 7. The changes in the optic-nerve fibres seem to be almost entirely intra-ocular, and cannot be traced for any great distance back of the eyeball."

Standish, of Boston,⁷⁶ gives the notes of a case of *retinitis albescans* occurring in a seemingly healthy man 31 years of age. Previous to the appearance of the white dots the macular region had appeared hazy and lighter in color than the rest of the fundus, and the vessels at the outer edge of this area had a gradual wave-like bend. Subsequently, there was exudation and infiltration about the disc, and the macular region contained a few shining, opaque spots. One week later the exudate had disappeared, and numerous small, white, rounded dots were to be seen all about the macular region, but more numerous between the macula and the nerve, and the visual acuity had increased by the aid of a + S. 4 D. from $\frac{2}{100}$ to $\frac{2}{30}$.

The accompanying illustration well represents a rare case of *retinitis pigmentosa* complicated by glaucoma, that has been seen by Bellarminoff, of St. Petersburg,²⁵⁴ July in a man aged 40 years. There was no history of consanguinity, but on the patient's maternal side there was hemeralopia and early blindness. The case is of interest because the pathological changes of retinitis pigmentosa, the interstitial inflammation, and the narrowing and obliteration of the vessels of the retina would rather predispose against the occurrence of glaucoma by lessening the quantity of blood in the eye. However, if the interstitial contraction blocked the exit of the venæ vorticoseæ, stasis in the blood-current might occur and the origin of the disease be fostered. The anamnesis and the ophthalmological examination gave evidence that the retinitis preceded the glaucoma.

A case of *glioma of the retina*, in a girl 4 years of age, is reported by Weymann, of St. Joseph.⁸¹⁴ Juno When first seen, the anterior chamber was filled with a yellowish mass, the tension of the globe was slightly increased, and there was slight proptosis. The eyeball was enucleated, but six months later a similar growth appeared in the other eye and caused death in one month's time. Microscopical examination showed the growth to consist almost entirely of small round-cells devoid of nuclei, although there were



Retinitis Pigmentosa
complicated with Glaucoma (Bellarmineff).
Archiv für Augenheilkunde.

some irregular polygonal cells and a few free nuclei. The blood-vessels were fully developed. The perineural and endoneurial spaces were crowded with gliomatous cells. The author thinks that the condition present in this case, when first seen, represents a definite clinical stage of the disease not previously recognized, and therefore recommends the division of the history into three periods, of which this would form the second. Moulton, of Fort Smith,¹⁰⁰⁷ Sept. has performed enucleation for this condition of the retina in a child 5 years of age. The growth filled one-third of the cavity of the globe anteriorly, while posteriorly a circular plate of tissue $\frac{1\frac{5}{8}}{100}$ millimetre wide and $\frac{1\frac{1}{8}}{100}$ to $\frac{2}{100}$ millimetre thick was found between choroid and sclerotic. This was intimately connected with the optic-nerve fibres, and had the same appearance of granular nucleated cells as the retinal growth, except that the fibrous stroma was more compact. Schoebl, of Prague,¹⁹⁰ Apr. has made a microscopical study of an eye which was enucleated for the same affection. The glioma-cells were found to contain large nuclei and a very small proportion of cellular protoplasm. The intercellular substance was very slight in amount, and was finely granular. The more recent glioma-cells were found in the immediate neighborhood of new blood-vessels, around which they formed a thick sheath. These cells were distinctly differentiated from quantities of broken-down glioma-cells which rested in the spaces between the vessels. This gave rise to a peculiar dendritic appearance in the growth. The author considered the tumor a cylindro-glioma. Blumenthal, of Riga,²¹ Jan. 14 has seen rapid increase in the growth of a tumor of this nature after iridectomy done for diagnostic purposes.

Thieme, of Liepzg,²⁰⁴ B.^{ss} reports three cases of glioma of the retina where it was impossible to diagnose this condition from the clinical picture. In the first instance, when the child was 4 months old, the disease was thought to be hydrocephalus, the anterior segment of the globe being ectatic, and there being no visible signs of a neoplasm. Several months later this portion of the globe was amputated, when a tumor presented in the region of the cicatrix, which proved to be a primary glioma of the retina. An ophthalmoscopic examination of the other eye, made at the time of the operation, revealed the presence of a growth. The death of the patient occurred not long afterward. The tumor had recurred in the socket, and had attained an enormous size. It had

also involved the entire glandular system. The diagnosis of the second case was rendered difficult by the fact that an inflammatory process, which led to the formation of bands of connective tissue, had affected the eye at the same time with the growth. The case was that of a child who had suffered a blow on the eye when she was 4 years old. Five weeks after the injury, a yellowish reflex from the fundus made its appearance. Shortly afterward, upon account of the clinical appearance, the diagnosis of post-traumatic irido-choroiditis was made. The ball was hard, the anterior chamber was filled with a yellowish-gray exudate, and a red reflex, thought to be blood, was obtained from the fundus. The globe was somewhat proptosed, this condition being thought to be dependent upon a retrobulbar haemorrhage. The eye was enucleated for the relief of pain. As the nerve was found to be infiltrated with gliomatous elements, exenteration of the orbit was performed, but the patient died shortly afterward from a secondary deposit in the brain. The author is of the opinion that the glioma had existed prior to the traumatism, which he thinks was the means of hastening the intra-ocular growth. The microscope revealed a primary retinal sarcoma complicated by an inflammatory process which had chiefly affected the anterior segment. This gave rise to large membranous formations, which surrounded the lens and produced the peculiar exudation in the anterior chamber.

In the differential diagnosis of pseudo-glioma and glioma, Collins, of London,⁴²³ v.13, p.111 points out that in glioma the appearance of the opacity behind the lens is modified according to the relation of the growth to the retina. If it spring from the inner surface of this layer, the ragged surface of the tumor is seen far back, with small, secondary nodules in front of it, and no retinal blood-vessels on its surface; while if it spring from the outer surface of the retina, a smooth mass having blood-vessels upon it is seen close behind the lens. The reflex obtained from a persistent and thickened posterior fibro-vascular sheath is usually grayer than that from glioma, and is usually confined to the central part of the posterior surface of the lens; occasionally, there will be a central spot suggestive of the termination of the central hyaloid artery. An inflammatory membrane behind the lens may have new blood-vessels developed in it, but these will be smaller than retinal blood-vessels. In glioma the lens is often pushed forward and the

anterior chamber is uniformly shallow. In pseudo-glioma the anterior chamber is often deepened at its periphery and shallow in the centre, from the organization and contraction of inflammatory products thrown out into the vitreous and circumlental space. In cases of persistent fibro-vascular sheath, the anterior chamber is sometimes very shallow. The presence of a remnant of pupillary membrane would suggest that other conditions present were probably congenital anomalies. The tension in pseudo-glioma is frequently minus, while the author believes that this condition is never present in a developed glioma. A history of brain-symptoms, ear disease, syphilis, or any acute specific fever preceding the eye affection would favor the diagnosis of "ophthalmitis." If the opacity were noticed at or soon after birth, the case would probably be one of glioma or due to an anomalous condition. If the growth were tubercular, there would probably be evidences of tuberculosis in other parts of the body.

DISEASES OF THE OPTIC NERVE.

An instance of *optic-nerve atrophy* with deformity of the skull is reported by Friedenwald, of Baltimore.⁵ The patient was an intelligent man, 26 years of age, who first noticed defective sight when at school, more marked in the left eye. Both nerves showed post-neuritic atrophy. Vision was reduced in both eyes, and the fields were greatly contracted on the nasal side. The author suggests that the compensatory enlargement in one part of the skull offers increased resistance to the growth of the brain, and that at periods this operates to increase intra-cranial pressure, and thus causes optic neuritis. He believes that, when this condition is present, the remedy would be trephining the skull in youth.

Mueller³⁵³ attributes a genuine atrophy of the optic nerve in three brothers to the small and pointed shape of their skulls. The family history was negative as regards ocular trouble. The disease appeared about the time of the consolidation of the bones, and a narrowing of the optic canal at this time might have produced the condition. A case of the same disease has been seen by Burnett, of Washington,²⁴⁹ in a boy. The patient's mother had blue-gray atrophy of both discs, and inquiry elicited that her mother, maternal grandfather, and five uncles and aunts on the maternal side had defective sight.

An interesting case of *angiolithic sarcoma of the optic chiasm*, in a man 37 years of age, has been reported by Aschman, of Wheeling.^{1007 July} When first seen, there was an absolute papillo-macula scotoma in the field of the left eye, that of the right being normal. There were no changes in the fundus. Two weeks later the scotoma in the left field had increased in size and a small central one had appeared in the right. Both defects gradually increased, until that of the left eye occupied a large sector-like area in the lower outer quadrant, and that of the right eye reached to almost thirty degrees on the temporal side. Three months subsequently the optic nerves had become atrophic. The motility of the eyeballs was diminished in all directions and ptosis had developed. After a period of intense suffering and frontal headache, paralysis of the left side appeared, and was followed, three days later, by the death of the patient. The autopsy revealed a tumor in the position of the optic chiasm, extending upward into the hemisphere, and reaching almost to the wall of the lateral ventricle on the right side. Two small masses projected from its lower surface. The structure of the optic chiasm, the optic nerves up to the foramina, the right olfactory nerve, the hypophysis cerebri, and points of the optic tract posteriorly were entirely obliterated. Both lateral ventricles were greatly distended, and the cerebral convolutions on the right side were markedly flattened. The growth was a large-celled vascular sarcoma, with deposits and accumulations of calcareous salts in the shape of little buds in connection with the blood-vessels.

From a study of four cases of *acute retrobulbar neuritis*, Elschnig, of Grätz,^{254 Dec., '92} concludes that the symptomatology of this disease can be accounted for by the anatomical findings of acute interstitial neuritis. The narrowing of the visual field in all directions observed in these instances can only come from the invasion of the nerve by an inflammation affecting the nerve from the periphery. In only one instance could compression of the nerve be considered as a possible cause of the blindness. The prognosis is the more favorable in cases where the papillitis is the least marked. In most cases the origin of the inflammation can be traced to micro-organisms and their products, but in others the casual element must be attributed to toxæmia, without understanding exactly what that word implies. Landau, of Berlin,^{190 Sept.} has seen an instance of *binoc-*

ular peripheral optic neuritis in a woman 26 years old. There was no history or manifestation of syphilis, and no accompanying implication of the nervous system. Examination revealed a slight degree of papillitis of the right eye, with a central scotoma of the corresponding side. The left eye became similarly affected shortly afterward. Under four weeks of energetic treatment with mercury and potassium iodide, the scotoma gradually disappeared. At no time were there any signs of central disease. The urine and blood were normal. The disturbance disappeared first in the right eye. Bourgeois, of Reims, and Guabe⁵⁷⁷ July have observed a case of *mixed tumor of the optic nerve and of the orbit*. The primary growth was a myxoma of the optic nerve that had caused progressive loss of sight in the affected eye. Secondarily, a sarcoma had developed in the cellular tissue of the orbit, and had invaded the myxoma. In spite of enucleation and extirpation of the growth, the tumor recurred.

In the treatment of atrophy of the optic nerve where the disease depends upon a vascular change in the interstitial connective tissue of the nerve, Valude, of Paris,¹⁷¹ Sept. has had good results follow the subcutaneous injections of antipyrin. With the exception of the gray atrophy of tabes dorsalis and the form that is due to primary degeneration of the nerve-fibres following compression, the drug is of service in cases of atrophy following ascending or descending neuritis. The author employs a saturated solution of antipyrin, a gramme ($15\frac{1}{2}$ grains) of the salt to 2 grammes ($\frac{1}{2}$ drachm) of distilled water, adding a little cocaine to relieve the pain. One gramme ($15\frac{1}{2}$ grains) of the drug is administered every other day. He has found improvement of vision, which is usually most marked for near objects. Riggs, of St. Paul,¹⁰⁵ Feb. 15 gives notes of two cases of optic-nerve atrophy in which the employment of the voltaic alternatives was followed by decided improvement in the acuteness of vision.

WOUNDS, INJURIES, AND FOREIGN BODIES.

Macleod, of Adelaide,²⁶⁷ June 15 cites three cases representing different types of ocular disturbance produced by *exposure to direct rays of the arc-light*. In the first instance the patient complained of asthenopic symptoms with micropsia and metamorphopsia, and of reddish after-images. The visual acuity was markedly reduced. The fields of vision were concentrically contracted and presented

positive central scotoma. The fundi were normal. In the second instance the lids were swollen and painful and the skin of the whole orbital region was red and mottled with dusky patches. The conjunctiva was chemotic, and there was a free muco-purulent discharge. The epithelium of the cornea was desquamating. There were photophobia and blepharospasm. The third case presented subjective symptoms similar to those in the first, but examination of the fundus showed hyperæmia of the discs, with considerable massing of pigment and apparently minute haemorrhages in the macular region.

Leplat²⁹³ July has seen an instance of penetration of the eye by the *sting of a wasp*. There was great chemosis, and about the point of entrance a patch of infiltration resembling that produced by an escharotic. The eye made a good recovery, with no tendency to involvement of its deeper tunics. Moorehead, of Ida Grove, Ia.,⁹ May 27 has removed a bee-sting from the conjunctival surface of the upper lid, penetrating the skin and tarsal cartilage, causing acute pain in the eye.

Berry, of Edinburgh, Nov. 19, 1902² reports two cases in which conjunctivitis with extensive ulceration of the cornea, accompanied by serious constitutional disturbance, followed the entrance of a fly into the conjunctival sac. In one instance the inflammation became diphtheritic in type. Hunt, of St. Paul,⁷⁷⁶ Jan. has removed a beard of grass from beneath the conjunctiva. The foreign body had been *in situ* for three months, and had excited a purulent inflammation. Froelich, of Geneva,¹⁹⁷ June 20 cites an instance of a *foreign body*, ten millimetres long by four millimetres wide, that had become encysted, and had remained in the conjunctival sac for a period of twelve years. The substance, which consisted of a partially macerated vegetable material, had caused but little irritation. Jackson, of Philadelphia,¹⁹ Oct. 22, 1902 has successfully employed the galvano-cautery for the removal of grains of gunpowder which had become so firmly lodged in the cornea as to prevent their extraction by other means. Roy, of Atlanta,¹⁰⁰⁷ Dec. 1902 records an instance of encapsulation of a fragment of steel which had penetrated the sclera and lodged itself high up in the fundus. After subsidence of inflammatory symptoms, vision equaled $\frac{6}{6}$. Borel¹⁹⁷ Mar. 20 has removed a piece of steel nineteen millimetres long from the vitreous by means of a forceps introduced through a scleral incision; the foreign body had been in position

ten days. The case recovered with full visual acuity. Pockley, of Sydney, ²⁰⁷ _{Jan. 16} successfully removed a similar body, that had perforated the eye at the lower and inner corneal margin, from the vitreous by means of the electro-magnet. The instrument was introduced through a meridional incision. The eye recovered with a visual acuity of $\frac{6}{5}$.

Hubbell, of Buffalo, ¹⁰⁰⁷ _{Feb.} reports a series of ten cases in which the electro-magnet was employed to remove fragments of steel from the eye. In eight the foreign body was apparently lodged in the vitreous, in one instance in the ciliary body, and in the other in the retina. In seven cases the fragment was extracted through the original wound. All recovered with useful vision except one, which was lost through infection. The author advocates a more general adoption of the sclerotic incision as the safest method of reaching steel when it lies at any point, even to the disregard of the original wound in many cases. By means of the electro-magnet, Marbourg, of Pueblo, ¹⁰⁰⁷ _{Apr.} has successfully removed a piece of steel which lay partly in the posterior chamber and projected into the pupillary space. Holt, of Portland, ⁹ _{July 25}, reports three cases of successful extraction of a piece of steel from the vitreous with the same instrument. In each case the foreign body had entered through the anterior chamber and was removed through a post-equatorial incision. The lens, which was injured, was subsequently absorbed, and good vision obtained in each case, notwithstanding that in one there was pus in the anterior chamber when the eye came under observation. By the aid of the same instrument, Thompson, of Cardiff, ² _{Mar. 18}, has removed a piece of steel measuring eleven by two millimetres from the vitreous humor. The foreign body had penetrated the lid almost at right angles to the surface. It was found standing vertically in the vitreous, with its long axis nearly parallel with the surface of the lid. It had been in the eye for two weeks and had not given the patient any inconvenience. Sanford, of Cork, ² _{Mar. 18}, gives the notes of a case where a rusty needle had remained imbedded in the cornea and lens for five years. The foreign body and the lens were both successfully removed. Bistis ²³² _{May 31} reports an instance of a penetrating wound of the eye by a fragment of a cap, which entered the sclera down and out, about three millimetres from its junction with the cornea. It became encysted and remained *in situ* for five months before the eye gave

evidence of any symptoms of inflammation. Dehenne, of Paris, ⁷ Dec.,'92 has seen a case in which a foreign body was found on the inner surface of the sclerotic, behind the ciliary region, where it had been imbedded for seventeen years before it gave rise to any symptoms. Fick, of Zurich, ²¹⁴ Sept. 1 reports two cases of injury to the eye by the entrance of a foreign body. In the first a wire chipping was removed by the method of Hirschberg, while in the second enucleation was necessary, as the foreign substance, a stone, could not be found after the extraction of the traumatically cataractous lens.

Valude, of Paris, ¹⁵² July 16 has seen an instance of double absolute blindness caused by a ball from a revolver. The weapon had been held against the right temple, three centimetres behind the end of the eyebrow. In the right eye the choroid was badly torn, and there was a rupture of the optic nerve. The sense of smell was also lessened. On the left side there was a rupture of the optic nerve, associated with ptosis, and a paresis of the superior and inferior rectus muscles. Snell, of Sheffield, ⁷⁶ May reports a case in which a leaden pellet passed through the eyeball without causing permanent impairment of sight. The missile entered the sclerotic on the nasal side, just above the insertion of the internal rectus muscle, and made its exit close to the optic nerve. Valude, of Paris, ¹⁵² Dec. 2, '92 cites an instance where five cilia were carried into the anterior chamber, the result of a perforating wound. The reaction soon subsided. After the performance of double keratotomy, the cilia were finally removed. The author believes that the fluid of the anterior chamber has a phagocytic action which prevents any septic material from doing harm.

Dodd, of London, ¹⁰⁷⁷ June 7, reports a case of increasing posterior polar opacity from a blow upon the eye, in a boy 12 years of age. Taylor, of Norwich, ² Dec. 17, '92 has seen immediate and permanent blindness resulting from a severe blow upon the eye, which had apparently produced but an abrasion of the skin of the lower lid. The author is of the opinion that the optic nerve was ruptured as a result of overstretching.

Callan, of New York, ²¹³⁹ Jan. gives the notes of nine cases of orbital traumatism resulting in immediate monocular blindness through fracture into the foramen opticum. In one instance the blow was received over the left orbit, and caused blindness of the right eye.

The author's explanation is that the jar made by the blow found its weak point along the line of sutures made by the union of the frontal bone with the nasal, superior maxillary, lachrymal, and ethmoid bones, until it reached the lesser wing of the sphenoid bone, where it received the first resistance occasioned by the bifurcation of the suture at this point; the unequal division of the force which here takes place resulted in fracture of the bone into the foramen opticum, causing compression of the optic nerve and sudden loss of vision.

Despagnet, of Paris,^{173 May} has seen an instance of pulsatile exophthalmus of the right eye consecutive to a fracture of the base of the skull, produced by a violent fall from a carriage. There was haemorrhage from the left nostril and ear. The patient complained of violent headache and a sawing sound in the head. No abnormal ocular symptoms appeared during the first five days. Upon the sixth, however, an oedema of the right eye appeared, followed by exophthalmus of the same character, as though produced by phlegmonous inflammation. There was considerable induration of the tissue and violent orbital pain. No visible pulsation nor bruit existed until the twenty-third day, when the former appeared. Compression of the eye was maintained during nine months. The exophthalmus disappeared, but pulsation in the internal angle of the right lid persisted. There was partial paralysis of all the muscles. As there was total loss of light-perception, it was deemed that there must be an atrophy of the optic nerve. Upon account of corneal opacity, no view of the fundus could be had. The fact that, in spite of the fracture being on the left side, the exophthalmus manifested itself on the right, is accounted for by the supposition that the line of fracture had gone beyond the median line, and had involved the summit of the bone corresponding to the haemorrhage. The palpebral oedema was due to infection propagated from the nasal fossæ, through the fracture in the internal wall of the orbit. Foster, of New York,^{1018 Apr.} records an instance of subconjunctival haemorrhage with ecchymosis of the lids of both eyes, following an accident in which the patient's neck was so severely compressed that the circulation in the cervical vessels was seriously interfered with.

Beer, of Berne,^{254 Oct., '92} has collected thirteen cases of enophthalmus following traumatism, and concludes that there is no doubt but

that a vascular spasm in the retrobulbar tissue, by decreasing the bulk of this tissue, may cause a transitory enophthalmus of varying degree. This condition may be produced by a traumatic irritation of the sympathetic vasomotor fibres, and the hypotony and ptosis at times associated with the condition would lend credence to this assumption. When, however, a more marked degree of enophthalmus appears some time after a more or less intense contusion of the ocular region, the cause must be regarded as being due to an atrophy of the retrobulbar cellular tissue. The causal connection between this affection and the trauma, however, is not clear, but doubtless depends upon a lesion of the sympathetic or trigeminal nerves.

Fuchs, of Vienna, ⁵⁷_{Mar. 12}, has seen an instance of enophthalmus follow fracture of the infra-orbital plate. There was an associated palsy of the inferior oblique of the wounded side. The resulting diplopia was corrected by a tenotomy of the superior oblique of the sound eye. Cohn, of Berlin, ³⁵³_{Oct. 92}, notes an example of the same condition from a perforating wound of the orbit. A fracture of the lower wall of the orbit, and the resulting cicatricial fixation of the globe at the seat of fracture, had given rise to the condition. Wintersteiner, of Vienna, ⁵⁷_{May 1}, has seen an instance of an implantation cyst in an eye perforated by a foreign body that had carried in a piece of cilia with its root. He proposed removing the tumor by a peripheral corneal incision. Fage, of Amiens, ²³⁰_{Aug.}, claims to have had excellent results from scleral suture in severe wounds of the eye.

Dehenne, of Paris, ⁷_{Dec. 92}, thinks that the ill results which often follow the entrance of foreign bodies in the eyeball are due to micro-organismal invasion through imperfectly-healed wounds. He cites an instance where a globe had been penetrated by a piece of steel. The organ did well for eight days under perfect antiseptic treatment, but at the end of that time, owing to the neglect of antiseptic precautions, serious intra-ocular symptoms demanding enucleation developed. Davis, of New York, ⁵⁹_{Oct. 15}, has made a study of 131 consecutive cases of enucleation performed by St. John Roosa, of New York. Of this number, 60 were performed for immediate or remote trauma, 35 for sympathetic ophthalmia, and 12 for sympathetic irritation. The cause of the sympathetic inflammation was recorded in 22 instances, and of this number 19, or 86.41 per cent.,

were dependent upon traumatism. It is interesting to note that in no case was sympathetic inflammation produced by panophthalmitis, nor was sympathetic trouble present in the 8 cases for which excision was performed.

Parker, of Lynchburg, ^{Aug.}⁸⁹, has enucleated an eye containing an encysted splinter of wood, lying just behind the ciliary body. It had entered the eye sixty-eight years previously. He also saw a splinter of wood, one-eighth inch in length, imbedded in the iris, with one end projecting into the anterior chamber, which had apparently been in the eye for a period of thirty years without causing other disturbance than diminution of vision.

Lagrange, of Bordeaux, ^{Nov. 27, '92}¹⁸⁸, believes that enucleation is indicated in all cases of panophthalmitis. He considers the operation to be free from danger, and has never seen any bad results follow. Risley, of Philadelphia, ^{July 15}⁹, has seen death from meningitis follow enucleation for panophthalmitis. Three weeks after the operation slight suppuration of the stump developed, and was followed by symptoms of meningeal involvement. The patient had been in extremely bad physical health. In cases where *panophthalmitis* is limited to the intra-ocular tissues, Truc, of Montpellier, ^{Oct., '92}¹⁷¹, recommends the operation of modified evisceration as the best preventive procedure. The technique is as follows: Ablation of the anterior segment of the globe, scooping out of the infectious masses, intra-ocular injection of boric acid or other antiseptic solution, and the application of antiseptic tampons to the eye. The general advantages are: 1. The operation is not very painful, and hardly ever requires general anaesthesia. 2. It is simple, and may be done without any preparations, and hence without great moral disturbance of the patient. 3. It preserves both a "moral" eye and a stump that is very useful for prothesis.

Hegg, of Berne, ^{Nov. '92}¹⁷³, cites an instance of *partial contraction of the ciliary muscle* in a man who had undergone enucleation of the other eye for panophthalmitis following a penetrating wound. When first seen, the ophthalmometer gave a reading of 2 dioptres of astigmatism. A plus cylinder of 1.50 dioptres gave a vision equal to 1.25. In one month's time the patient was only able to tolerate a plus cylinder of 0.50 dioptre (vision equaling 1.25). The writer thinks that the power of partial accommodation was regained by an improvement in health which had been affected by

the operation at the time of the first examination. Brandenburg, of Treis, ⁶⁹_{Mar. 30}, believes that it is better to enucleate a panophthalmic eye at once, rather than to wait for the subsidence of the inflammation, provided that rigid antisepsis is maintained and the precaution is taken not to sew conjunctival flaps together. Briggs, of Sacramento, ¹⁴⁷_{Apr.} has enucleated an atrophic eyeball in which the tissue of the choroid and iris was completely replaced by a calcareous deposit. The fellow-eye showed symptoms of sympathetic irritation.

Schirmer, of Halle, ²⁰⁴_{B. 38, II, 3}, has re-investigated the subject of sympathetic inflammation, and, in order to avoid wrong conclusions, insists upon the distinction being made between sympathetic irritation and sympathetic inflammation, pointing out that the nature of the affection of the exciting eye, of the sympathizing eye, and the interval of time between the affection of the two eyes respectively, must be considered in establishing a diagnosis of the latter condition. Neoplasms and injuries *per se* were not found to cause the disease, the accompanying iridocyclitis being regarded as the causal element. When the condition arises after operation, the uveitis in the operated eye is responsible for the inflammation, this uveitis depending upon microbial infection, and not upon mechanical or chemical irritation. The disease in the sympathizing eye usually takes the form of a papillo-retinitis or of an uveitis, which may either appear as a serous or a plastic iritis or as a malignant iridocyclitis. The author believes that the bacterial theory explains all the objections that can be urged against nervous irritation as the causal element, though there is as yet insufficient evidence to consider any particular form of bacteria as the organism in question. The germs migrate directly from one eye to the other. If the eye be blind and if it be capable of exciting sympathetic inflammation, or even if the inflammation has broken out, it should be excised.

Knapp, of New York, ⁹_{July 29}, gives the notes of a case of sympathetic inflammation following traumatic dislocation of the iris, in a man 45 years of age. The entire iris was found under the conjunctiva, two millimetres from the inner corneal limbus. There were no other lesions, the lens being in position and free from opacity. Twenty-nine days after the accident sympathetic inflammation developed and ultimately destroyed the sight of the fellow-

eye. The vision of the injured eye was reduced to $\frac{2}{200}$, and the iris had shrunken to a flat, blackish mass, which was scarcely raised above the conjunctiva.

Weiss, of Heidelberg, ²⁵⁴_{Oct. '92} describes the ophthalmoscopical appearances in two sympathizing eyes. In the first instance the disease appeared as a neuro-papillitis, whilst in the second there was, at first, slight congestion and oedema of the retina, developing into the typical picture of albuminuric retinitis. The author is an adherent to the migratory theory of the production of the disease, and believes that the bacteria are carried along the lymph-streams.

Greff, of Berlin, ²⁵⁴_{Apr.} has made a careful bacteriological examination of three cases in which one eye had been blinded as the result of an injury and the other had developed symptoms of sympathetic ophthalmia. In none of these was he able to find any micro-organisms. He therefore concludes that it is possible for micro-organisms to be found in eyes lost by sympathetic ophthalmia, even though the majority of investigators have been unable to determine their existence. As sympathetic ophthalmia has appeared in this latter class of cases, one is not justified in asserting that they were caused by micro-organisms. Where the general system is saturated with germs it is to be expected that some would be found in the eyes. Their presence, then, in an eye affected with sympathetic ophthalmia would not have any significance in the production of the disease. Sutphen, of Newark, ²⁴⁹_{Jan.} has seen an instance of *sympathetic neuro-retinitis* with plastic iritis, following a wound in the ciliary region in a 5-year-old boy. A microscopical study of the exciting eye showed diffuse cellular infiltration, with spots of deeper infiltration of the posterior half of the choroid, and beginning atrophic changes in the detached retina and in the intra-ocular portion of the optic nerve. A careful bacteriological investigation failed to reveal any micro-organism. Colburn, of Chicago, ²⁷⁹_{Jan.} states that in sympathetic inflammation he would only perform optico-ciliary neurotomy upon the exciting eye as the last alternative, and with the understanding that subsequent enucleation might be required.

Hotz, of Chicago, ⁹_{July 15} reports a case of *sympathetic neuritis following evisceration*, where the eye made a good recovery. The author has measured the movements of artificial eyes inserted after

evisceration and enucleation, and over an atrophic eyeball, and has found that the excursions were practically the same in all three instances. The argument advanced in favor of evisceration, that it affords a better support for an artificial eye, is thus not substantiated; and the operation is in every way inferior to enucleation, as it is attended by more pain, slower healing, and greater danger of sympathetic trouble. In an eye exhibiting sequelæ of sympathetic ophthalmia of several years' standing, in which vision was reduced to counting fingers at three millimetres, Hamilton, of South Australia,<sup>267
Feb. 15</sup> has performed Critchett's operation on three occasions, and, after a final discussion of the capsule, has obtained a vision of one-half normal.

GLAUCOMA.

Uhlrich, of Strassburg,<sup>254
Dec., '92</sup> discusses the various theories on the origin of glaucoma, and describes his own as follows: The basis of glaucoma is the pathological change in the iris-tissue, namely, the disease of the blood-vessels. The obliteration of the vessels of the iris leads to a collateral hyperæmia of the ciliary processes, and secondarily to hypersecretion. On account of this the ciliary processes increase in size, press the iris and lens forward, and render the pupillary connection between the anterior and the posterior chambers very narrow. Stagnation of the increased quantity of fluid in the posterior chamber occurs, and the peripheral portion of the iris is driven forward. The iris becomes altered histologically, is less adapted to filtration, and is finally driven forward until it comes in contact with the cornea. Being engorged with blood and inflammatory exudate, it finally becomes glued to the periphery of the corneal layer. As one of the exits of the fluid of the eye is shut off, increased work is thrown upon the other avenue of escape for the fluid in the optic nerve. This increased work, in conjunction with the heightened intra-ocular pressure, leads in a short time to a pathological excavation of the optic nerve-head. The glaucomatous attack is precipitated by any cause, either general, as heart disease, or local, as mydriasis, which influences and retards the circulation of the blood, and may be instantly relieved by a dilatation of the blood-vessels of the iris. Iridectomy exerts a curative action by establishing a communication between the anterior and posterior chambers. Love, of Phil-

adelphia,¹⁰¹⁸ July is of the opinion that in a majority of cases of glaucoma the causation is of nervous origin, and that the disease may be prevented by appropriate treatment directed toward any existing nervous affection. Samelshon, of Cologne,⁷⁸ May concludes that syphilis can, in certain subjects, give rise to the disease by causing an arterio-sclerosis of the vessels of the uveal tract. He reports two cases in which an iridectomy had been performed for acute glaucoma. One month after the operation there was another glaucomatous attack. Examination revealed a marked descemetitis, which, together with the glaucomatous symptoms, disappeared under proper specific treatment.

To demonstrate that glaucoma in cases of apparent absence of the iris is not incompatible with blocking of the angle of the anterior chamber, Treacher Collins, of London,⁴¹ Oct., 1922 has studied three interesting cases: 1. Congenital absence of the iris and opacities in the lens. 2. Congenital coloboma of the iris and lens outward, with glaucoma. 3. Traumatic aniridia and glaucoma. In the first case the ciliary body ended in a rudimentary iris in its entire circumference, though clinically none could be seen. There were abnormal adhesions between the ligamentum pectinatum and the root of the iris, and quite sufficient iris to block the whole posterior surface of the pectinate ligament should it have become pushed forward. The author points out, therefore, that it is quite possible for eyes in which no iris could be seen to become glaucomatous. In the second instance the filtration-area was found more than half closed by a small process in which the ciliary body terminated. In the third case the lens had escaped at the time of accident, and its capsule had become adherent to the corneal cicatrix, thus drawing forward the most anterior ciliary processes and blocking the filtration-area. Storey, of Dublin,⁷⁶ Mar. records a series of five cases of glaucoma in individuals between the ages of 13 and 35 years. In the youngest the attack followed the subconjunctival injection of a solution of cocaine and lasted three hours. In one instance the disease was of the acute inflammatory type, and occurred in a woman 18 years old. The fourth case was seen in a man, 30 years of age, with microphthalmus and an hereditary tendency to the disease. Of thirty-one eyes affected with glaucoma, the author has found the average corneal diameter to be 11.9 millimetres.

Ayres, of Cincinnati, ³⁴⁷_{Jan.} has observed a case of this affection in a girl 18 years of age. The optic discs, which appeared less than half the normal size, were deeply cupped. The right eye was blind, and the vision in the left eye was greatly reduced, the nasal field being abolished. Vision and tension were improved by eserine. Hays, of Wichita, ⁸⁰¹_{Dec., '92} gives the notes of a case in which glaucomatous symptoms supervened upon the instillation of atropine into the eyes of a woman 40 years of age. A successful double iridectomy was performed. F. M. Chisolm, of Baltimore, ⁴³_{Aug.} reports a case of glaucoma occurring two months after cataract extraction with iridectomy. Improvement was prompt under the use of eserine, but ten days later a relapse occurred, for which a second iridectomy was made with successful results.

Santos Fernandez, of Havana, ¹⁷¹_{Nov., '92} reports four cases of glaucoma complicating senile cataract. He believes that iridectomy should be performed in such instances, followed after some days by extraction of the cataract, except where there are definite contraindications to the latter procedure. When iridectomy is attended with danger, owing to a shallow anterior chamber, the tendency to loss of vitreous, and of the wound remaining open from the iris being forced against the cornea, and in cases of dislocated lens accompanied by increased tension where extraction is to be attempted, Gifford, of Omaha, ¹⁰⁰⁷_{Oct.} advises performing a preliminary posterior sclerotomy. With a cataract-knife he makes a subconjunctival incision, from three to four millimetres in length, through the sclera into the anterior part of the vitreous. Where iridectomy permits, the corneal cut must be made with a similar instrument.

Hotz, of Chicago, ¹⁰⁰⁷_{Dec., '92} cites a case of glaucoma in which enucleation was performed subsequent to an iridectomy. Section of the globe showed numerous haemorrhages throughout the fundus. Later, haemorrhages appeared in the retina of the other eye, but the tension remained normal for a period of almost two months, at the end of which time the eyeball became stony hard and an iridectomy was successfully made. The author believes that this case shows that the glaucoma was not induced by the haemorrhages nor these by the glaucoma, and that the term "haemorrhagic glaucoma" is not a good one to apply to such cases. Dunn, of Richmond, ⁴⁰_{Feb.} is of the opinion that, while haemorrhagic glaucoma is to be considered as distinct from the inflammatory type, it may have its origin in

hæmorrhage or diapedesis from the vessels of the uveal tract as well as those from the retina. De Bourgon, of Paris,¹⁷¹ Mar. concludes that in the hæmorrhagic period of hæmorrhagic glaucoma the general condition must be treated and the ocular congestion relieved. The treatment, in the period of confirmed glaucoma, should be first medical, and to general sedative measures simple myotics, moist heat, and injections of ergotin into the temple should be added. When the symptoms are not relieved by these medicinal measures sclerotomy is indicated. If repeated trials of this operative procedure fail, recourse must be had to enucleation.

Weinbaum, of Göttingen,²⁰⁴ B.88.H.3 has made a microscopic examination of an eye that was enucleated on account of hæmorrhagic glaucoma. The eye was removed from a man with apparently normal heart and lungs. The point of interest was a thrombus three-fourths of a millimetre long in the central vein of the retina, one and one-fourth millimetres behind the lamina. This sprang from the wall of the vein. The walls of the retinal vessels elsewhere showed no change, the endothelial lining being quite healthy. There was a well-marked ectropium of the uveal pigment, the angle of the anterior chamber being blocked by the formation of connective tissue. The pars ciliaris retinæ showed a cystoid degeneration. The disc was excavated and the nerve-fibre and ganglionic cell-layers of the retina were much atrophied. The author thinks that the thrombus originated in a local affection of the vein which was essentially foreign in its nature, the section suggesting a possible early sarcoma, but he is in doubt as to whether the glaucoma or the thrombosis was the primary condition. Weeks, of New York,²¹³ Jan. has seen peculiar pigmentation of the cornea in a case of secondary hæmorrhagic glaucoma. A light rusty-brown opacity occupied the cornea, except at the periphery. Microscopical examination showed that Bowman's membrane was normal, but that the substantia propria, throughout the extent corresponding to the opacity, contained numerous pigment-granules, largest and most numerous just beneath Bowman's membrane. A few of the lymph-channels in the apparently clear parts of the cornea were crowded with pigment-granules, and appeared to be the paths through which the pigment in a liquid form traveled from the sinus of the anterior chamber into the substantia propria. Chemical examination failed to give the character of the deposit. The author is of the opinion

that it consisted of haematin precipitated from the solution of haemoglobin which filled the corneal tissue from Fontana's spaces.

Wallace, of Philadelphia,¹¹² finds that the instillation of cocaine in cases of acute glaucoma where there is severe pain is followed by reduction of tension, improvement in vision, and diminution of inflammatory symptoms.

From his experience with scleritomy Nicati, of Marseilles,¹⁷¹ gives the following summary: 1. The results are remarkably favorable in the treatment of staphyloma of the cornea consecutive to necrosis of that membrane. It is an excellent preventive measure. If the tension become increased, the operation should be renewed at intervals of several weeks. 2. The results are less satisfactory in simple glaucoma. The operation in this class of cases should be performed with a narrow knife, to avoid haemorrhage and prolapse of the iris. Normal scleritomy, "in contradistinction to the oblique operation," deserves an important place in the treatment of certain secondary glaucomas, but not in essential glaucoma, as the wound in this latter class of cases cicatrizes and does not leave a trace of a curative fistula. Badal, of Bordeaux,¹⁸⁸ has successfully stretched the external nasal nerve for the relief of pain in two cases of glaucoma.

SECTION IV.

MEDICAL OPHTHALMOLOGY.

Gould, of Philadelphia,^{1018 July} has examined the eyes of two families, several members of which were *albinos*. In the first family, of seven children all but the third (a male) and the sixth (a female) exhibited this abnormality. Of the second family, of two children the first alone was affected. From a study of these cases the author arrives at the following tentative conclusions: "1. Albinos are normally, and even exaggeratedly, healthy in body and mind. 2. There is no discoverable influence of heredity in the cause or transmission of the peculiarity. 3. The sole pathological influence of albinism is upon the eye. 4. The ocular evils—photophobia, nystagmus, ametropia (especially high degrees of hyperopic astigmatism), and amblyopia—are directly and indirectly caused by the transparency of the iris. 5. The *modus operandi* of this etiological

factor lies (*a*) in the brilliant and diffuse illumination of the fundus of the eye by the non-exclusion of the peripheral rays of light by the faulty diaphragm, producing photophobia; (*b*) the lid and muscular pressure upon the globe, resulting from the attempt to exclude the light, produces the refractive anomaly; (*c*) the effort of the groping eye to localize and definitize the evanescent and indistinct image produces the nystagmus; (*d*) the amblyopia is a necessary consequence of all these combined factors. 6. Proper correction of the ametropia lessens eye-strain, lessens photophobia, and increases the power of near-range vision. 7. True prophylaxis and cure must look to the pigmentization of the iris, or to the construction of an artificial opaque substitute for naturally faulty irides. 8. The younger any treatment, or prophylaxis or treatment, is begun, the more promising will be the results."

Hewetson, of Leeds, ^{June 24}, has seen several cases of *acute inflammation accompanied by blepharospasm* and great pain in the head and eyes, resulting from viewing the operation of electric welding without suitable protection. The symptoms did not appear until several hours after the exposure. All the cases were benefited by the use of cocaine and cold applications. The author states that the men employed at this work have found by experiment that the best protection is afforded by the use of a wooden shield provided with a window, into which are inserted five sheets of ruby glass. Freeland ^{July 29} reports a case in which exposure to the intense glare of an electric search-light occasioned symptoms similar to those recorded by the above observer.

Despagnet, of Paris, ^{24 July 30}, reports a case of *intense optic neuritis* where the symptoms were immediately ameliorated by the extraction of a *carious tooth*. A periostitis was propagated to the orbit at the optic foramen, where the nerve was compressed and its functions were interfered with. There was a paralysis of the iris and of the ciliary muscle, which the author thinks was reflex, due to a neuritis of the fifth nerve. He had enucleated the other eye five years previously for tubercle, and the appearance of the neuritis in the remaining eye made him fear a recurrence of the trouble. He divides ocular troubles of dental origin into two classes: 1. Those manifesting themselves in the anterior segment of the eye, producing lesions in the innervation of the supply of the fifth nerve and occurring as inflammations of the conjunctiva and cornea, asthe-

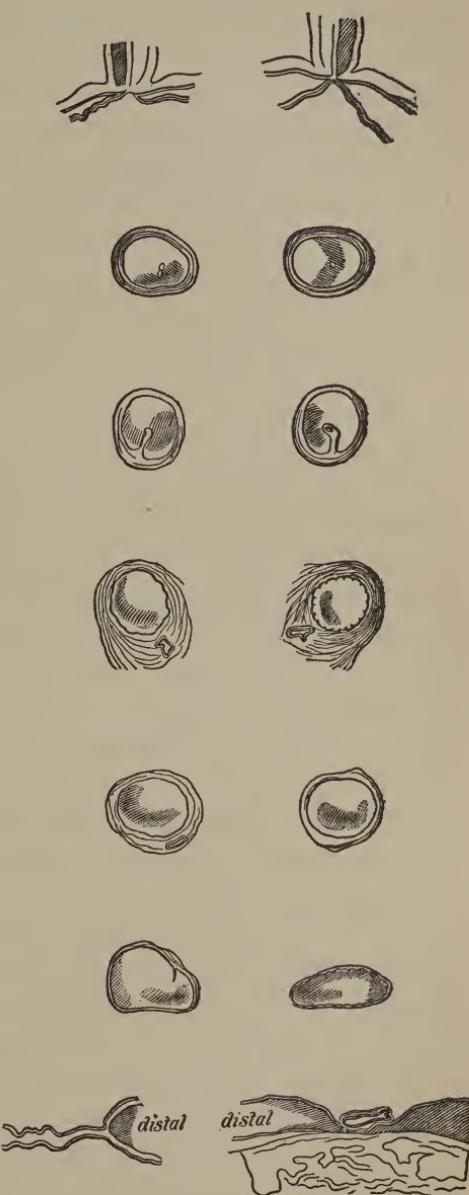
nopia, or partial or total paralysis of the iris and of the ciliary muscle. These alterations are the results of dentition or of a beginning caries or simple avulsion, and are quite frequent. 2. Those situated in the posterior portion of the eye and at the back of the orbit, taking the form of inflammation of the periosteum or of the deeper orbital tissues, and producing an inflammation and consecutive atrophy of the optic nerve by compression. These are rare. Park, of Harrisburg,^{1018 Jan.} has observed a case of *monocular amblyopia* associated with haze of the disc and retina, in a woman aged 41 years, apparently due to dental irritation of the fifth pair, as vision, which had been reduced to counting fingers in the lower outer field, returned to normal after the extraction of the roots of several teeth from the superior maxillary bone of the corresponding side.

Lagrange, of Bordeaux, has cured a case of *obstinate blepharospasm* by stretching the *nasal nerve* on the same side. The case had previously resisted all other treatment. The affected eye was the seat of a kerato-conjunctivitis. Trantas, of Constantinople,^{274 June} has seen total ophthalmoplegia, exophthalmus, and amblyopia accompany inflammations of the maxillary, sphenoidal, and posterior ethmoidal sinuses. The cure of the last removed the ophthalmoplegia and improved vision. The fundus, which was at first normal, later revealed the presence of a blanched disc. The author thinks that the optic and the involved motor nerves were affected, as they passed through the optic foramen and the sphenoidal fissure.

Peretti, of Muelheim, ^{69 Mar. 30} has seen *atrophy of the optic nerve* appear fourteen days after an *injury* to the head. The visual fields were contracted peripherally. There was a slight ptosis and divergence of the visual axes. From these symptoms, the author is inclined to think that the lesion must have involved the optic foramen. Genouville, of Paris, ^{274 Feb.} has made an autopsy on a case of basilar fracture of the skull which had produced *paralysis of the abducens nerve*. The ethmoid bone and nasal fossae were found to be completely detached by different fractures, which met on the right side at the optic foramen, and on the left at the sphenoid fissure. The nerve appeared healthy at every part, but was surrounded by a blood-clot at its entrance into the cavernous sinus. This clot, he thinks, doubtless originated from a fracture of the tip

of the petrous portion of the temporal bone, to which the author attributes the cause of the paralysis.

Sachs, of Innsbruck,²⁵⁴ Apr. has seen an instance of *compression of both optic nerves and chiasm* by the blood-vessels at the base of the brain. The patient was a woman 26 years old, and, as her sight was never complained of, the first indication of the ocular condition was found at the autopsy. After the calvarium was removed, a flattened tumor was seen to project over the sella turcica, and the optic nerves were observed to be nearly cut through by the pressure of the arteries which ran over them. Both nerves were lengthened and flattened, and so far pressed apart from one another that both were found at the point of origin of the arteries of the corpus callosum, which came from the internal carotid. The right nerve showed a groove of compression running obliquely across it. This groove was occupied by the anterior cerebral artery of that side. The groove on the left nerve took the same course as the preceding, except that it was only distinctly marked anteriorly. The chiasm was flattened. Microscopical examination showed that only certain fibre-bundles



SECTION OF THE OPTIC NERVE. (SACHS.)
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which were symmetrically placed near one another had suffered extensive degeneration. The right nerve was seen to be much more affected than the left. The diagram on preceding page represents the topographical relationship of the degenerated fibres. In regard to the visual disturbance, as the chiasm must have been the first part of the apparatus affected, a bitemporal hemianopsia would doubtless have been the first change in the field, which, however, would not have been sharply cut; central vision would also have been reduced. From the extensive change in the papillo-macular bundles, there would also have been symmetrical paracentral scotomata on the temporal side.

Snell, of Sheffield,⁷⁶ May has seen two cases of *blindness from facial erysipelas*. The first occurred in a man 48 years of age. Upon subsidence of the attack of erysipelas, which had principally affected the left eye and side of the face, the eye was found to be blind, and an examination five weeks subsequently revealed haziness and pallor of the disc with contracted arteries. In the second case, the erysipelas had affected both sides of the face and the right arm, there being considerable swelling about the face and eyes. The blindness appeared during the attack. Ten weeks later, examination showed incipient post-neuritic atrophy in both eyes, associated with haemorrhages upon the surface of the right disc. Subsequently, haemorrhages into the retina and vitreous occurred in both eyes. Although there probably was slight orbital cellulitis in both cases, this would account for the condition present; the peculiar poison of erysipelas, the author thinks, producing a condition in the vessels which was favorable to the formation of thrombi. Scougal, of Huddersfield,⁷⁶ May gives the notes of a case of *double optic atrophy* occurring five weeks subsequent to the same disease, affecting the malar, supra-orbital, and temporal regions of the right side. There was no evidence of orbital cellulitis, and vision had been unaffected during the attack.

Seguin, of New York, ¹ Dec. 3, 1902 advances the opinion that the majority of the cases presenting the symptoms usually ascribed to "cerebral hyperæmia" or to "congestion of the base of the brain" are "cases of eye-strain, exhaustion, and hyperæsthesia, resulting from the persistent use of weak neuro-muscular organs, more especially the third and sixth nerve-apparatuses. Errors of refraction seem to play but a secondary part in the genesis of the symp-

toms, whereas they are very important in cases of cephalalgia and migraine. Suboccipital pain and distress (the chief symptoms of congestion of the base of the brain) are due to defective power of convergence and accommodation."

Frankl-Hochwart, of Vienna, ⁸ believes that where there is a concentric narrowing of the visual field, associated with a corresponding reduction in the perception of light and colors, in traumatic cases, the conditions may be regarded as of neurasthenic origin. Bonnier, of Paris, ¹¹ has seen a case of *herpes* affecting simultaneously the ophthalmic and the auriculo-temporal nerves. Vesicles appeared in the area supplied by the left frontal nerve, groups being present over the eyebrow, near the median line, close to the hair and near the temple. The eyelids were reddened and swollen. Later, vesicles developed upon the left tympanic membrane. Gruening, of New York, ²¹³⁹ has seen two cases of affection of the *cervical sympathetic*. The first occurred in a married woman, 55 years of age, who presented ptosis and myosis on the right side, with midrosis of the corresponding side of the face. In diffuse daylight, the pupillary diameter in the right eye was three millimetres; that of the left, six millimetres. In direct illumination of both eyes and in convergence, both irides reacted in the same manner, and became smaller and equal in size. The second instance occurred in a man 21 years of age, and showed the same ocular symptoms as the first, but there was no disturbance of the secretion of sweat. No alteration in accommodation was present in either case.

Sergeant, of Paris, ¹⁰⁰ has seen an instance of *exophthalmus* in a man, 44 years old, who was able to protrude the eye at will. From a study of this and other reported cases, he concludes as follows: 1. That exophthalmus occupies the place definitely assigned to it by Yvert,—*i.e.*, in the group of venous tumors of the orbit,—by communicating directly with the intra-cranial venous circulation. 2. That the latest doubts as to the venous nature of the condition are dispelled by the results obtained by compression of the jugulars. 3. That there is no idea of a tumor proper, implied by its venous character, as the exophthalmus is due simply to a varicose dilatation of all the veins of the orbit, or of but one large trunk, namely, the superior ophthalmic. 4. That this disposition to venous dilatation from individual and local predisposition is

more the effect of an anomaly than of a pathological lesion; it is closely connected with the absorption of the fatty tissue of the orbit, and the relaxation of the ligamentous apparatus of the eye. 5. That intermittent exophthalmus is a benign affection of slow evolution, non-progressive, without effect upon the vision or upon the general health. 6. That the diagnosis is easy, for the characteristic symptoms are pathognomonic. 7. That the treatment consists in abstention. 8. That, as the exophthalmus is under the control of the patient, the condition should be called *voluntary exophthalmus*.

Albrand, of Berlin, ⁶⁹ Mar.²⁰ has observed a case of *one-sided blepharospasm*, which he calls an "hemicrania angioparalytica." He believes that a periodical relaxation in the walls of certain cerebral and pial vessels was the cause of the accompanying headache, and flying scotoma—a subacute glaucoma necessitating iridectomy—was caused directly by the paretic condition of the sympathetic fibres, or indirectly by irritation of the centre controlling the vasomotor nerves of the eye. The author cites a case where the removal of a chalazion caused the disappearance of a localized twitching of the upper lid. Pflüger, of Berne, ²¹⁴ Feb.¹⁵ has observed a *peculiar condition of the palpebral fissure* in a young girl. When the patient looked to the left the fissure of the right eye appeared normal, but when she looked downward and to the left it became abnormally wide. The fissure was narrowed by looking directly in front, and it became still smaller by looking up and out.

Dianoux, of Nantes, ¹⁷¹ Sept. divides the ocular affections produced by *grave febrile conditions* into (a) phlebitic, (b) cyclitic, and (c) panophthalmitic, the first form being more common during the period of convalescence. The loss of sight is sudden, and there are no external local manifestations of the disease. Sight may be regained. Usually, however, blindness persists. The cyclitic variety was seen both during the disease and in convalescence. The inflammation was confined to the epithelial layer of the ciliary bodies, the leucocytes being poured out into the anterior chamber and into the vitreous. At times vision, or, at least, the conservation of the globe, was the result. Panophthalmitis occurred most usually after puerperal fever and erysipelas, and was generally monocular in type.

White, of Richmond, ^{July 15}⁹ gives notes of two cases of *typhoid fever* complicated by a disease of the optic nerve. In the first instance optic neuritis developed at the end of the third week and continued for three months, ending in complete recovery. In the second case optic atrophy was noted four months after an attack of typhoid fever, during the course of which vision had begun to fail, and had continued, notwithstanding the improvement in general health. Marked betterment of vision occurred under increasing doses of strychnia. The same author cites a case of blindness following malarial remittent fever. Under the use of potassium iodide, followed by strychnia, perfect recovery was effected in four months.

As sequelæ to typhoid fever, Alt, of St. Louis, ^{Nov., '92}³⁴⁷ has twice observed keratomalacia, and in one instance orbital cellulitis with total adhesion of the iris to the capsule of the lens. He has also ^{Jan. 16}³⁶⁴ twice seen total necrosis of the cornea as a post-typhoid condition, and regards the affection not as the result of specific typhoid infection, but of continued exposure of an organ greatly reduced in resisting power.

Fox, of Philadelphia, ^{Aug}¹²¹ gives an interesting description of the ocular conditions found in the different stages of *Asiatic cholera*. Lagrange, of Bordeaux, ^{Sept.}⁷⁸⁰ reports an instance of dacryo-adenitis of the lachrymal glands, produced by *rheumatism*, in a young man 22 years old, disappearing under large doses of salicylate of soda. Pryce, of Nottingham, ^{Jan. 21}² has observed chalky deposits arranged along the small blood-vessels of the conjunctiva and on the caruncle, in a man 71 years of age, whose joints were the seat of *gouty accretions*.

Mueller ^{Jan.}³⁵³ has seen an instance of retrobulbar neuritis and proptosis in a gouty subject, and attributes it to an inflammation around the optic foramen. Uthoff, of Marburg, ^{B. 89. H. 1}²⁰⁴, has made a careful study of 100 cases of *syphilis of the central nervous system*. In all, ophthalmic examination was made during life, and autopsy was performed in 17 of the cases. In 12 cases the patients were affected with gummatous basilar meningitis; in 3, this condition was uncomplicated by other inflammatory processes; in 3, there was evidence of cerebral softening; in 5, there were specific changes in the cerebral arteries; gumma associated with syphilitic cerebral arterial disease occurred twice; in 1, gummatous meningitis of the

convexity of the brain; in 1, a spot of cerebral softening with disease of the arteries, associated with a gummatous degeneration of the left intra-cranial optic tract and corresponding half of the chiasm; in 1, the disease was almost entirely limited to the cord. Basilar gummatous meningitis and syphilitic disease of the arteries occurred the most frequently. In 7 cases the time of the specific infection before the breaking out of the central disease was found to be between four and ten years. In only 2 were perceptible changes in the globe of the eye found,—one a gummatous iritis, the other an irido-choroiditis. The result of autopsies, however, showed that the optic-nerve apparatus was affected fourteen times. In two instances it showed itself as a papillitis; in others, as a simple or secondary atrophy. Where there were visible ophthalmoscopic changes there was always a diseased condition of the orbital portion of the optic nerve. The intra-cranial portion of the nerve evidenced an unusual disposition to pathological change, having escaped neuritis, perineuritis, or gummatous change in but five instances. The chiasm was similarly prone to inflammation, and was the starting-point of the disease in the 12 cases of cerebral syphilis with disease of the chiasm and the intra-cranial portion of the nerve. The optic tract, on the other hand, was involved but once. The ophthalmic artery and its peripheral branches were but seldom affected by endarteritis, and neither embolism nor thrombosis occurred in any of the cases. The oculo-motor nerve was affected unusually often, being diseased on both sides. Six times disease occurred on both sides, four times on one side. The abducens was involved three times and the trochlearis but once.

Burnett, of Washington,^{249 Jan} reports a case of double papillitis, probably of specific origin, recurring three years after subsidence of the first attack. The patient was a colored woman, aged 30 years. Boe, of Paris,^{173 Apr} gives the notes of a case of specific optic neuritis in a man 38 years old. Rapid improvement followed large doses of iodide of potassium and mercury. Mercury, at times, he says, increases rather than diminishes the disease. He uses the drug in all cases, but replaces it by lactate of zinc if its good results are not immediately manifest.

Hartridge, of London,^{2 Oct. 29, '92} has seen double optic neuritis following a second attack of influenza in a girl 16 years of age. The macular region contained numerous bright, scattered patches. The

urine was free from albumen. Burnett, of Washington,^{249 Jan.} has observed two cases of retrobulbar neuritis with consecutive atrophy, two instances of primary atrophy, one of monocular central scotoma, and one of monocular atrophy. In the latter case, the patient, a negro 31 years of age, had complained, during the course of the disease, of severe pain in the temple, radiating toward the ear and the side corresponding to the eye, which subsequently became affected. The disc was pallid and slightly excavated. The field of vision was entirely wanting except at the upper inner part. Brown, of Minneapolis,^{1007 May} reports a case of monocular optic atrophy consecutive to *mammary carcinoma* and *influenza*. A case of right hemianopsia has been seen by Gifford, of Omaha,^{1007 May} in a man 48 years of age. Both optic discs were somewhat pallid.

Mueller^{353 Aug., '92, Jan.} has seen *chemosis of the eyes* in a woman aged 32 years. Ever since the patient was 24 years old, eight days before, during, or eight days after her menses, associated with an intense headache, the conjunctiva would become so swollen that it would protrude between the lids. Eliasberg^{190 Mar.} cites an instance of *uræmic amaurosis* in a young woman *who was being confined* for the fifth time. Two years and a half after the delivery of the child there was only light-perception, the irides reacted normally, and the fundi appeared void of change. The blindness disappeared in two days. Cheney, of Boston,^{99 June 15} has seen a case of acute bilateral ophthalmoplegia externa and interna, occurring ten days after confinement, in a woman 33 years of age. The paralysis developed in the right eye after an attack of severe pain in the corresponding eye, temple, and brow, accompanied by œdema of the lid and conjunctiva. Five days later, the left eye became similarly affected. Vision in each eye was reduced to counting fingers. The optic discs were congested and hazy, and the veins were full and somewhat tortuous. The paralysis continued unchanged for seven weeks, and then gradually improved. Physical examination showed the heart to be normal, but a loud systolic murmur could be heard over the head and down to the second cervical vertebra. He thinks the ocular symptoms may be most satisfactorily explained by supposing that there was a localized inflammation of the dura mater, with sufficient swelling or exudation to compress the nerves and veins involved near that point of entrance into the orbit. Ole Bull, of Christiana,^{171 Oct., '92} reports a case

of optic atrophy in which vision was temporarily lost during the latter half of a second pregnancy. A third pregnancy produced complete loss of vision with less complete recovery, while a fourth left a vision of but $\frac{1}{36}$. The final ophthalmoscopic examination showed simple atrophy of the optic nerve.

Morton, of Minneapolis,^{105 Sept. 1} cites four instances of reflex ocular manifestation dependent upon *disturbances of the sexual organs*. The first was one of persistent photophobia and lachrymation which was relieved by an operation for paraphimosis, the second was a case of diplopia dependent upon an adherent prepuce, and the third and fourth were cases of retinal hyperæsthesia and asthenopia resulting from masturbation. From a study of these cases, the author concludes: 1. That foci of irritation in the genitals may, through the medium of the reflex nervous system, induce various neuroses of the eye. 2. That while the precise laws which govern the passage of these impulses from other than their natural return channels is not known, it is probable that the impulse, greatly intensified by the condition of the reflex centres, which are connected by commissural bands, flows on to fibres that present a field of less resistance than the usual efferent pathway, and thereby flows into an innocent organ with dire results. 3. That the full appreciation of this possibility should be constantly in the mind of the ophthalmologist and neurologist, and stimulate him to search for all possible peripheral foci of irritation. 4. The trouble frequently disappears upon the removal of the remote point of irritation.

Hotz, of Chicago,^{1918 Jan.} cites three cases of "blood effusions between the retina and vitreous body." In two the haemorrhage occurred in females, one suffering from suppression of the menses, the other from disturbance of the circulatory system attending chronic bronchitis and dyspepsia. The third case appeared in an apparently healthy man. In all three the blood became absorbed and sight was restored.

Pollak, of St. Louis,^{347 May} gives the notes of a peculiar case of ophthalmia occurring during the course of an attack of *acute nephritis*, in a girl aged 7 years. The patient complained of erythropsia and photophobia, which was followed, four days later, by the appearance of a white, homogeneous substance filling the anterior chamber, unaccompanied by inflammatory symptoms.

The eyeballs were anaesthetic, and light-perception was abolished. Ten days later the effusion began gradually to absorb, under diuretic treatment, but no reflex could be obtained from the fundus. The condition remained stationary for a period of two weeks, when panophthalmitis occurred in the right eye, necessitating enucleation. The left eye recovered with a cataract and sequelæ of irido-cyclitis. The author ascribes the chalky appearance of the cornea to a metastasis of albumen into the anterior chamber. An examination of the enucleated eye made by Alt, of St. Louis,³⁴⁷ May showed total detachment of the retina, firmly united by cyclitic new formations. The angle of the anterior chamber was filled with a transparent gelatinous substance. The subretinal and supra-choroidal spaces were occupied by congealed exudation, thick layers and collections of yellowish substance being deposited upon the inner surface of the choroid. Microscopically, the iris, ciliary body, and the chorio-capillary were filled with round-cells. The venous layer of the choroid and the subarachnoidal layer and space were occupied by a net-work of fibrin, containing the remnants of the normal tissues and round-cells. This membrane reached forward on the outer surface of the choroid and the ciliary body to the place of insertion of the latter into the corneo-scleral tissue. Alt considers the condition to be a croupous irido-choroiditis, as micrococci, which resembled the staphylococcus pyogenes aureus, were found in the exudates.

From the study of the eyes of a number of *diabetic patients*, Kamocki, of Warsaw,²⁵⁴ Oct., '92 has found the pigment-layer of the iris of normal thickness, and closely approximated to the iris in only one instance. In all other cases the uveal layer showed different phases of alteration from proliferation and oedema. In several instances there was thickening of the blood-vessel walls in the stroma of the iris, which would account for the cloudiness of the aqueous humor after the iris has been seized during the cataract operation on diabetic individuals. The causation of cataract is primary death of the epithelial cells, with the attendant change in the processes of diffusion. In regard to amblyopia diabetica, Mauthner, of Vienna,⁵⁷ June 18 concludes that this disease is only to be diagnosed after amblyopia ex abusa has been excluded. As diabetes is an exhausting process which would favor intoxication amblyopia, it is necessary to exercise great precaution in diet. This form of

disease is to be regarded as one of amblyopia ex abusa, and not as the precursor of a fatal ending.

Friedenwald, of Baltimore,⁷⁶ believes that the condition of interrupted blood-columns occasionally seen in the blood-vessels in pathological conditions of the eye is due to a separation of the circulating blood into parts that are free from blood-corpuscles and into parts in which the blood-corpuscles are aggregated in masses. This condition was found to occur only when the current was greatly retarded.

Gayet, of Lyons,⁷⁸ has seen an instance of *intermittent blindness* in an apparently healthy boy 17 years old. The attacks had lasted over periods ranging from three to twenty-four hours, even up to four or five days. At times the blindness would come on suddenly. The irides were responsive during the attacks. There was a history of meningitis at three years. Four months and a half before the first appearance of the symptoms, the lad had fallen from a bicycle into a canal without apparent cause. The fields were normal, and there were no signs of hysteria. The author is inclined to view the case as one of passing auto-intoxication by materials capable of acting on the nervous system. Campbell, of St. Louis,⁷⁷ considers the subject of ocular reflex neuroses under two heads: (1) those from the eyes to and implicating other parts and organs, and (2) those from other parts and organs affecting the eyes. The author cites sympathetic ophthalmia as an instance of the former class, and glaucoma as one of the second.

Antonelli⁹⁴ Nov. concludes as follows: 1. That the name of *transitory amblyopia* should be given to those forms of disease commonly known as ophthalmic migraine, scintillating scotoma, etc. The term of complicated transitory amblyopia should be reserved for those cases where there is a disorder of speech, or intelligence, or partial or complete epilepsy. 2. That transitory amblyopia should be ranged, in the majority of cases, like migraine, among the purely dynamical nervous disorders, the most severe attacks being dependent upon a temporary disorder of the brain. 3. That transitory amblyopia is essentially characterized by different ocular troubles, such as hemianopia, symmetrical peripheral scotoma, monocular or binocular central scotoma, amblyopia, or even total amaurosis, double hemianopsia, etc. Peripheral vision is more often affected than central, and both eyes at a time more frequently

than a single eye. The more usual form of transitory amblyopia is hemianopsia, complete or incomplete, as in the typical cases of scintillating scotoma. The disease appears and disappears more or less suddenly. The scintillation should be considered as an epiphrenomenon in the order of hallucination, due to circulatory irritation of the cortical visual centres. Headaches, complicated at times by sensations of vertigo, are often present. 4. The disease is a common one, and has for its cause some constitutional predisposition, or in many cases a cerebral vasomotor trouble exists. In a certain number of cases it seems to be idiopathic. The affection is more common among females, and nervous heredity (gout or diabetes) plays an important rôle. 5. The irritation of the cortex (especially of the cuneus and of the superior occipital convolution) will give rise to the symptoms, and the two forms, the monocular and the hemianopsia, of transitory amblyopia constitute a serious argument in favor of the double connection of the optic nerves with the hemispheres. 6. Prognosis should be guarded, as the disorder may be a precursor of epilepsy, or a slight form may develop into one more grave. 7. The treatment should be directed toward the general condition. Bromides, hydrotherapy, frequent and slight purgation, quinine, digitalis, etc., are all of use according to the constitutional cause. The best means to break up an attack is to place the patient on the back and have him close his eyes.

Thomas, of Geneva,¹⁹⁷ Dec. 20, '92 has observed an instance of *ophthalmic migraine* in a lad, 14 years old, of neurotic antecedents, who had had, on several occasions, attacks of cephalgia. These were attended by luminous sensations of a brilliant globe, by a motor and sensory paralysis of the right arm, and by logoplegia. The field of vision was contracted and the pupils were normal. The irides reacted normally to light and accommodation. There was an anaesthesia of the pharynx, and a zone of hyperæsthesia in the left groin. The author thinks that this case was hysterical in nature, as the condition improved remarkably under treatment for that condition.

Snell, of Sheffield,⁶ July 15 records two cases of recurrent third-nerve palsy associated with migraine. The first was seen in a man, aged 27 years, who had suffered from migrainous attacks since the age of 10; but during the past seven years these paroxysms had been accompanied by practically complete paralysis of

the third nerve. The palsy did not disappear entirely in the intervals between the attacks of hemicrania. In the second case, in a girl aged 18 years, the involvement of the oculo-motor was not so complete, but continued for a longer period, and did not recur so frequently as in the first instance. Hilbert, of Sensburg,¹⁹⁰ has observed an interesting instance of *chloropsia* in a neurotic woman, 63 years old, who had previously suffered from flying scotomata. The chloropsia appeared immediately after an intense headache, and became increasingly worse with a progressive loss of sight. The only thing abnormal in the eye-ground was that the retinal vessels were extremely tortuous. The author considers the cause of the green sight to have been central, and associates it with hemicrania and flying scotomata. Heddaeus, of Essen,^{254 July} states that in the ordinary form of *double reflex pupillary inactivity* the pupils are narrowed, but are easily dilated by cocaine, when the irides acquire, in good measure, the power of contracting to light and to accommodation, thereby showing that an irritation of the third nerve is the cause of the contraction. In all the cases of one-sided reflex mydriasis accommodation is intact, the cause being located in the centrifugal part of the reflex-arc for light-reaction, from the supposition that the third nerve of one side has only the greater part of its root on that side, while a smaller portion springs from the opposite side. One-sided reflex pupillary mydriasis is present when the irides of both eyes, though failing to react to light by alternating exposure to varying degrees of light stimulus, respond to accommodation. Seggel, of Munich,^{254 Jan.} has seen a well-marked instance of left-sided reflex pupillary inactivity, in a case where there was an associated paralysis of the corresponding superior oblique, and a slight ptosis of the same side. Vision, the size of the pupils, and the accommodation were the same in both eyes. The left iris was absolutely inactive to light, but reacted well to convergence. The condition was due to a disease of the brain, as tabes dorsalis was excluded from the diagnosis. Schroeder, of St. Petersburg,^{21 June 10} has had a case of paralysis of the associated movements of the eyes below, joined with a spasm of the movements above, which he attributed to a paralysis of the centre of conjugated ocular movements. There was no diplopia. Verrey^{197 Mar. 20} has seen an instance of paralysis of the associated movements of the eyes during upward and downward fixation. This

paralysis had appeared suddenly, and was accompanied at first by a marked tendency of the patient to deviate to the left when walking. At the end of several weeks the condition disappeared. He thinks that a small haemorrhage in the corpora quadrigemina or their neighborhood might have produced the symptoms. Arens⁴⁵⁴ has observed *complete monolateral ophthalmoplegia, with ptosis and blindness* of the same side, in a healthy young man 17 years old. When first seen, the pupil was unaffected and vision was good; later, the former became dilated, and the iris did not act so readily. These conditions were followed by blindness. The author made a diagnosis of constriction of the nerves supplying the affected muscles in the optic foramen, as a result of tumefaction or of engorgement of the dura mater in that position. Under the influence of an energetic alterative treatment the condition somewhat improved.

Two cases of ophthalmoplegia externa, with paresis of the orbicularis palpebrarum, have been studied by Hughlings-Jackson, of London.⁶ In the first the patient was unable to bring the edges of the lid closely together, while in the second, although closure was effected, there was decided feebleness of resistance on the part of the muscle, and it was less responsive to the faradic current than normal. Clinically, these cases strongly support Mendel's hypothesis that the fibres from the seventh nerve, which supply the orbicularis palpebrarum, have their origin in the nucleus of the third nerve. Maher, of Sydney,²⁶⁷ Aug. 15 reports three cases of paralysis of the ocular muscles of nuclear origin. The first instance was one of double ophthalmoplegia interna in a man, 27 years of age, who five years previously had contracted syphilis. The paralysis was complete on the right side and incomplete on the left. In the second case there was complete double external ophthalmoplegia, with defective associated lateral movements. The patient was a boy 12 years of age. Three years previously he had suffered from attacks of headache and vomiting, followed by the appearance of slight ptosis. The author believes the lesion to have been a tubercular deposit which had undergone absorption, permanently impairing the posterior nuclei of the third nerve and the posterior longitudinal fibres of the tegmentum of the crura. The third case was in a man, 29 years of age, who, within the previous twelve months, had had two attacks of cerebral disease, with head-

ache, vomiting, impaired speech and memory, and inability to read as sequelae. When first seen, three weeks after a convulsive attack, there was partial right hemianaesthesia and complete paralysis of all the ocular muscles supplied by the left third nerve, with complete paralysis of the intra-ocular muscles and partial paralysis of the intra-ocular muscles innervated by the right third nerve. There was partial hemiplegia and slight double optic neuritis. In this case the author believes the lesion to have been syphilitic, involving both the anterior and the posterior nuclei of both third nerves and the reticular formation of the tegmentum of the left crus cerebri. Suckling, of Birmingham,^{Mar. 25} gives the notes of two cases of functional ophthalmoplegia with general paralysis and implication of the cranial nerves. The first case was that of a woman, 21 years of age, tall in stature, who complained of progressive muscular weakness, which had set in three years previously and had become associated with paralysis of the tongue, with attacks of suffocation. The patient was unable to stand unsupported or to raise the arms above the head. Mastication, deglutition, and articulation were accomplished only with great difficulty. The knee-jerk was slightly increased. The hands and feet were continually blue. Irritation of the larynx produced suffocation, with cyanosis and inspiratory stridor. The movements of the eyeballs were restricted in all directions, and were accompanied by nystagmus. There was slight bilateral ptosis. The lids could be partially closed, but the attempt was attended by fibrillary tremor of the orbicularis. At times there was diplopia. The intra-ocular muscles were intact. The fundus was normal, and the visual fields were not contracted. There was nothing abnormal in any of the other organs of the body. The second case occurred in a very tall girl 18 years of age, and almost exactly resembled the first instance, differing only in there being no attacks of suffocation nor coldness of the extremities, that the patient could walk for a very short distance, and that there was slight chorea. "The gradual onset and slow progress without any sudden changes, the implication of muscles supplied by the third, motor portion of the fifth, sixth, facial, hypoglossal, and spinal accessory nerves, the nuclei of which form a continuous series in the iter and fourth ventricle, tend to prove that the disease is not hysteria," but functional, and doubtless closely allied to exophthalmic goitre. In both instances

exhaustion seems to have been the exciting cause, and in each case there was a neurotic family history. The author sees no reason why both should not recover.

In completing his exhausting study of *coal-miners' nystagmus*, Romiée, of Liège,¹⁷¹ _{Oct. 15, '92} concludes that the essential etiological factor is overexertion of the muscles of accommodation, which brings about clonic contractions of the extra-ocular muscles. Errors of refraction, especially hypermetropia, with poor light, and a weak general condition from any cause, predispose to it. Position has no effect in the production of the condition. Treatment should assist accommodation for near work, this being best done by the employment of sulphate of eserine; atropia, however, meets the indication in an opposite way, by paralyzing the accommodation, though in his hands it has not given the same good results as eserine, and, at the same time, it diminishes vision. Strychnia is a useful adjuvant. Cocking, of Sheffield,² _{Oct. 15, '92} has seen a case of this affection associated with double spasmotic torticollis in a man 48 years of age. Both symptoms could readily be induced by the patient assuming the position maintained at his work. Court,² _{Oct. 15, '92} maintains that defective illumination is the cause of the disease. He denies that the eyes are turned obliquely upward during "holding" or "undercutting," and claims that many miners get rid of the affection under improved illumination, without change of occupation. Snell, of Sheffield,² _{Oct. 15, '92} contends that the prime cause is fatigue induced in the "ocular elevators," in consequence of strained attitude. In support of this theory, he cites his own and the reported cases of Berry and Nieden, occurring in other than miners, in which position of the patient and not illumination was the exciting cause. Priestley Smith, of Birmingham,² _{Oct. 15} considers the condition as due to a continuous effort to "fix" under conditions which render continuous fixation peculiarly difficult; while insufficient stimulation of the retina disposes to nystagmus, the causative effect of constrained positions is evident by the existence of disordered movements in other groups of muscles. Hewetson, of Leeds,² _{Oct. 15} has seen the disease, uncomplicated by other ocular disturbances, in three daughters of a miner, who, early in life, had become affected with the same disease. Snell, of Sheffield,² _{May 13} directs attention to the very important fact that miners afflicted with nystagmus are unable to see the pale flame or cap which appears around

the safety-lamp flame in the presence of fire-damp until the percentage of that noxious gas is greater than can be borne with safety. Thompson, of Cardiff,²¹⁴⁰ has found that nystagmus was common among "steam-coal" workers, who did not labor in constrained positions, but used the safety-lamp, whilst it was rare among "house-coal" miners, who worked in the prone position, but with naked lights. Bell, of Bradford,^{Oct. 15, '92}² considers the important factors to be unnatural position of the body and inclination of the eyes, with deficient illumination. Heddaeus, of Essen,⁶⁹ Aug.³ evolves the *hemianopic pupillary inaction sign*, by first placing the patient, with one eye bandaged, in a dark room, the patient being told to look straight ahead. A lamp is placed on each side and one foot away from him, in such positions that the rays from each lamp enter the eye at angles of about fifty-five degrees. The lights should be sufficiently intense that the edge of the pupil on each side can be plainly seen. The lights are then alternately concentrated by a high convex lens and thrown into the eye from opposite sides. From a study of 143 cases of true inequality in the size of the pupils, Reche, of Breslau,⁶⁹ Mar.³⁰ has found this condition in 62 cases of hypermetropia of the same degree, in 11 of myopia, in 4 of presbyopia, and in 1 congenital. In none of these cases could any cause for the anisocoria be found. Eyes in which vision is poor have wide pupils, which he thinks is a reflex process to permit of more light entering the eye. The right pupil was found to be more generally smaller than the left, perhaps due to an overdevelopment of the sphincter iridis of that side, as the right side is usually better developed than the left.

Schmidt-Rimpler, of Göttingen,²⁵⁴ Apr. reports a case of right *homonymous hemianopia*, where there had been paralysis of the right extremities associated with headache and convulsions. One year after the development of the symptoms, following a short prodromal stage, there was a subjective lessening of the visual field, followed by sudden and absolute blindness. A small central field re-established itself. This contracted again to almost nothing. Autopsy showed a hard haematoma, which was, doubtless, the cause of the right-sided hemianopia, while a cicatricial contraction in the region of the posterior central convolution had given rise to the hemiplegia. Three or four scattered foci of inflammation in the posterior portion of the right posterior lobe, on the border-line

between the white and gray substance, doubtless produced the loss in the left visual field. Holmes, of Northampton, ⁹⁹ Feb. 16 records a case of left homonymous hemianopia in a man 45 years of age. Thirty-one years previously the patient had been shot through the head, the bullet having entered the right temporal region and having passed out three inches above the external occipital protuberance. The injury was followed by left hemiplegia and epileptic convulsions. The latter began on the paralyzed side, but became general. The sense of taste and smell were impaired on the left side. The knee-jerks were equally exaggerated, and the irides reacted to light and accommodation. The hemianopic pupillary inaction sign was absent. Würdeman and Barnes, of Milwaukee, ²⁴⁹ Apr. have made a very careful study of a case of temporal hemianopsia with recovery, followed by right lateral hemianopsia with partial recovery. The fields, which were first taken after a severe attack of headache, followed by poor sight and hyperesthesia of the finger-tips, and of both legs from the knees downward, showed temporal hemianopsia with contracted color-fields in the nasal halves and preservation of the central vision. Later, central scotoma developed. This condition improved, except for a small central scotoma for red and green, which persisted in the left eye. Three months later, after a period in which there had been only light-perception, right lateral hemianopsia with obliterated central vision and a large central scotoma for red was found. There was also paralysis of the elevator and internal rectus muscles on the left side. Seven months later the field was no longer hemianopic for white on either side, but remained so for red on the left side. In both eyes there was central scotoma for red. Both discs appeared white and atrophic, but vision equaled $\frac{6}{24}$ in O. D. and $\frac{6}{30}$ in O. S.

A case of right homonymous hemianopsia, occurring in an apparently healthy girl 21 years of age, is reported by Claiborne, of New York. ⁸¹ Dec. '92. The ophthalmoscope showed a slight haziness of the right optic nerve, which soon disappeared. There was permanent impairment of memory and transitory anaesthesia of the right side. The following illustrations show the pathological changes in a case of left homonymous hemianopsia, occurring in a woman 43 years of age, as reported by Dunn, of Wakefield, Ill. ⁴⁷ Autumn, Winter. The patient was addicted to the excessive use of

alcohol, and was maniacal when first seen. There was paresis of the left side, with slight rigidity of the elbow- and shoulder-joints, and constant convulsive twitching of the corresponding leg and arm. The pupils were equal and semidilated. The reaction of the irides was normal. Two weeks later there was anaesthesia of the left side and slight ptosis of the left eyelid. The ophthalmoscope showed no pathological changes in the fundus. Three months

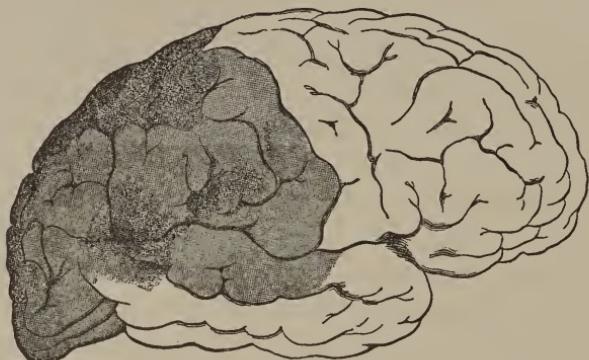


FIG. 1.

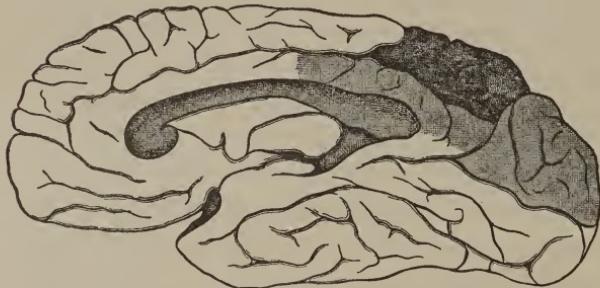


FIG. 2.

POST-MORTEM APPEARANCE IN A CASE OF HOMONYMOUS HEMIANOPSA. (DUNN.)

Fig. 1, exterior surface of right hemisphere; Fig. 2, mesial surface of right hemisphere.

Brain.

later the patient died of pneumonia. For two weeks previous to death the left pupil was widely dilated. The autopsy showed a cyst the size of a pea in the posterior part of the roof of the descending horn of the right lateral ventricle, near the margin, with marked disintegration of the surrounding area. The right hemisphere, from and including the ascending parietal gyrus backward, was swollen, softened, and collapsed. The occipital lobe showed extensive softening. The temporal gyri and frontal lobe,

however, appeared healthy. Upon section the white matter of the parietal and of the occipital lobes, more especially the anterior two-thirds, were also found to be softened. The convolutions in the left hemisphere were rather small, but not otherwise abnormal. The author believes that the primary lesion was at the position of the cyst, in the posterior part of the roof of the lateral ventricle; and it was noteworthy that, although the angular gyrus was affected to an extreme degree, there was no crossed amblyopia. Asmus²⁰⁴ reports an instance of temporal hemianopsia in acromegaly in a woman, in whom the symptoms of the disease first

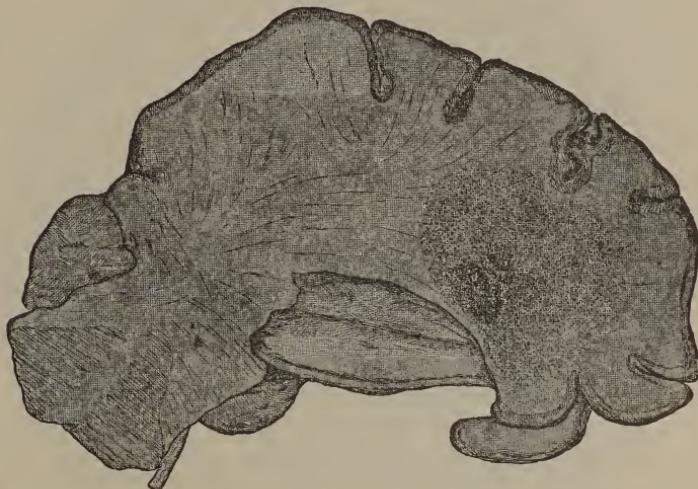


FIG. 3.

POST-MORTEM APPEARANCES IN A CASE OF HOMONYMOUS HEMIANOPSIA. (DUNN.)

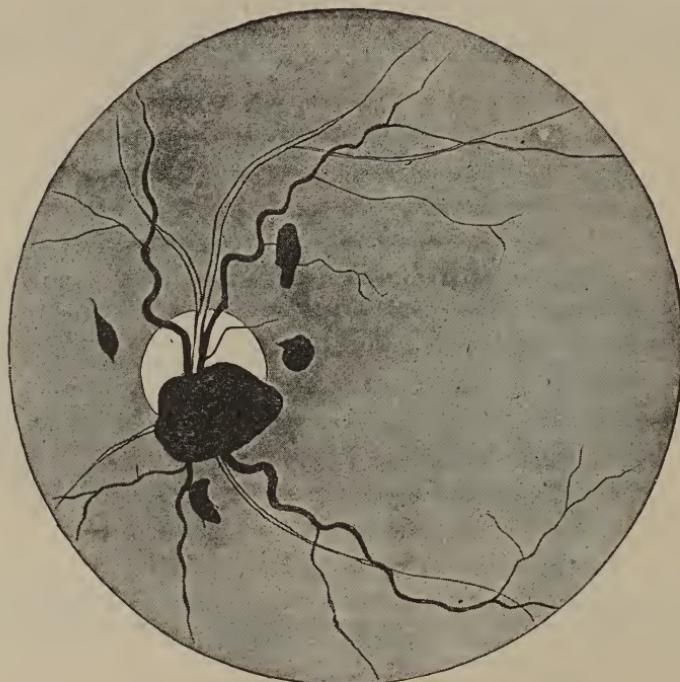
Fig. 3, deep horizontal section of right hemisphere, showing softening in posterior part of roof of lateral ventricle.
(Depth of shading indicates degree of softening.)

Brain.

appeared when she was about 40 years old, manifesting themselves in hypertrophy of the tissues of the hands, lips, and nose, and in an increased appetite. There was a history of gradual deterioration of vision during the last seven years. The skull was normal in shape, whilst the face was strikingly large and long. External examination of the eyes revealed nothing abnormal. The ophthalmoscope, however, showed a beginning atrophy of the optic nerves, without any signs of choked discs. The irides reacted when light-stimulus was thrown upon the external halves of the retina. There was a well-marked hemianopsia upon the upper temporal and lower nasal angles. As the fields pointed to a tumor involving

the chiasm, increasing doses of potassium iodide were given. In spite of this treatment, there was no change in the fields.

A case of right lateral homonymous hemianopsia, in a girl 21 years of age, is reported by Meighan, of Glasgow.^{213 Aug.} The visual disturbance was preceded by vomiting and by severe frontal headache, worse on the left side. The limits of the visual field in the right eye extended to 55 degrees on the nasal side, while that of the left eye reached from 85 degrees on the temporal side to within



THROMBOSIS OF CENTRAL VEIN. (RANDOLPH.)
Johns Hopkins Hospital Bulletin.

5 degrees of fixation. In explanation of the production of the homonymous superior hemianopsia in the case previously reported by him, Boé, of Paris,^{274 Oct., '92} suggests the hypothesis that there may have existed an abnormal distribution of the nerve-fibres, one optic tract sending its crossed and direct fibres to the superior halves of each retina, while the other tract supplied the inferior halves, and that specific disease of a single occipital lobe might have produced the symptom.

Randolph, of Baltimore,^{764 June, July} has made an ophthalmological

examination in 35 cases of *epidemic cerebro-spinal meningitis*, and found the fundus to be normal in only 7 instances. Optic neuritis was present in 6 cases, and retinitis associated with thrombosis of the central vein in 1. The ophthalmoscopical appearance of the latter condition is shown in the accompanying sketch. The remaining cases were characterized by a remarkable tortuosity and distension of the retinal veins and more or less congestion of the disc. Among the nervous phenomena noted were divergent strabismus, nystagmus, and dilated pupil.

Goldzieher, of Budapest,^{190 Feb.} has studied clinically and at the post-mortem a case of *tubercular tumor in the corpora quadrigemina*, producing bilateral exterior ophthalmoplegia, in a child 5 years of age. There was complete ptosis on both sides, and all the external muscles supplied by the third nerve were paralyzed. The irides and the ciliary muscles responded normally. The other cerebral nerves were uninvolved. The gait was staggering and the patient was very irritable, and had marked convulsions. From a study of this case, the author concludes: (1) that a tumor occupying the whole area of the corpora quadrigemina need not be associated with blindness; (2) that complete typical ophthalmoplegia exterior need not be caused by primary changes in the nuclei of the third nerve; (3) that ophthalmoplegia combined with staggering and inco-ordination of the lower extremities points to a lesion of the corpora quadrigemina; (4) that convulsive twitchings of the extremities, with general epileptiform convulsions, can be caused by a lesion of the corpora quadrigemina alone.

Vialet, of Paris,^{14 Aug. 30} has seen two cases of left-sided hemianopsia with incomplete right hemiplegia. The case upon which autopsy was performed had right-sided hemianesthesia. The left hemisphere showed a condition of recent white softening which involved all the cortex and the white matter of the posterior portion, while on the right side the anterior quarter of the cuneus had been destroyed by old yellow deposits. Histological examination showed that the affection had involved the anterior two-thirds of the cuneus, the anterior half of the calcarine fissure, the bottom of the internal perpendicular fissure, and the foot of the cuneus, reaching to the foot of the hippocampus; this territory corresponding to the part supplied by the branches of the occipital artery. The lesion had produced a degeneration in the radiating fibres and

those of association between the two hemispheres, in the form of two zones: one small one on the external wall of the occipital horn; the other, a larger one, involving all of the inferior semicircumference of this same horn. This would prove that the integrity of the cuneus is necessary for the perception of visual sensations, and that, as a consequence, this circumvolution takes part in the cortical visual sphere; and, on the other hand, it furnishes important anatomical facts upon the course of the fibres of association or projection leaving the cuneus; the fibres of projection originating at different parts of the cuneus, following different avenues, in order to arrive at the central nuclei. Of those which come from the anterior and superior part of the ventricle, those from the posterior inferior part pass over the occipital horns, and are collected together at the inferior posterior part of the pulvinar and of the external geniculate bodies. The fibres of association which emanate from the corner follow two paths; some are placed at the superior part, others at the inferior part, of the tapetum; but both join one another at the level of the claustrum of the corpus callosum in order to pass into the opposite hemisphere.

Morrow, of Canton, O.,^{1007 Oct., '92} cites two cases of *brain-tumor* in which optic neuritis was the first and, up to the time of its detection, the only positive evidence of organic brain disease. In the first case the autopsy showed a pear-shaped glioma, two inches in length, lying at the base of the middle lobe with its larger extremity directed backward into the temporo-sphenoidal lobe. The second instance was one of soft glioma involving the superior surface of the cerebellum, covering the superior vermicular process, and extending about equally over each lateral hemisphere. Zenner^{53 July 22} reports a case of *tumor of the optic thalamus* in a boy aged 18 years. For several months the patient had suffered from attacks of bewilderment, headache, and disturbances of olfaction, and later from right hemiparesis and diplopia. Examination showed that the facial paralysis was more noticeable in laughing than in voluntary acts. The external rectus of the right eye was paralyzed, and all the lateral movements were restricted. When the eyes were turned to the left, there was slight nystagmus in the right eye. The sense of hearing was less acute on the right side, that of smell on the left. The left eye was nearly blind, and in the right eye there was left hemianopsia. The left optic disc was apparently

normal, and the right was choked. Just previous to death, which occurred from exhaustion, both eyes became blind. Autopsy showed a tumor, probably gliomatous in character, occupying the posterior portion of the base of the left thalamus, the mass projecting upward into the cavity of the left lateral ventricle. The facial paralysis confirms the experimental findings upon animals, that the thalamus controls the expression of emotions.

Guépin, of Paris,⁷⁸ reports an instance of probable *gumma of the base of the brain* in a woman 33 years old. There was relative ptosis of both eyes; slowness in the movements of the globe, especially of the left; paresis of the left external rectus; and diplopia. Integrity of the pupillary movements existed, and the pupils were of moderate diameter and unequal in size, slight left mydriasis being present. The irides responded equally, and no subnormal color-perception existed. The ophthalmoscope revealed a double retinitis, most marked on the left side. The other organs exhibited nothing abnormal, and there was no other manifestations of syphilis. He believes that, in cases of manifest sclerosis of the nervous elements of the optic nerves, there is conservation of the axis-cylinder and relative integrity of the connective tissue of the nerves. This form of sclerosis has for a long time been confounded with that of the connective tissue which causes rapid destruction of the nerves and its transformation into connective tissue. In the former variety the nervous elements are not entirely destroyed; the vessels are but little altered, and there is a possibility of the regeneration of the functions of the nerve. However, these points of dissimilarity should not be exaggerated, for every sclerosis is a mixture of both forms. The variety of the sclerosis is determined by the character of the initial neuritis. Sclerosis of the connective tissue follows true neuritis, whilst sclerosis of the nervous tissue manifests itself in those cases of neuritis which are more obscure in course, slower in development, and perhaps less inflammatory.

Meighan, of Glasgow,²¹³ gives the notes of two instances of *optic neuritis of intra-cranial origin* which illustrate the fact that optic neuritis arising from these disorders may run not only its early, but its entire, course without obvious affection of vision. The first case was a man, 45 years of age, who complained of dimness of sight of three months' duration. For a period of ten or twelve years previously, the patient had suffered from slight con-

vulsive seizures, accompanied, during the last few years, by headache and dizziness. During an attack of unconsciousness paresis of the left side occurred, but was gradually recovered from. There was pronounced neuritis in the right eye and blurring of the edges of the disc in the left eye. The fields of vision for form and color were contracted to an equal degree in both eyes. The vision of the right eye was reduced to $\frac{2}{4}^{\text{th}}$, and that of the left to $\frac{2}{5}^{\text{th}}$. The second case occurred in a man, 23 years of age, who, eight months previously, had been attacked by severe pain radiating from the forehead to the occiput, followed by vomiting, defective sight, and dizziness, and, finally, by unconsciousness, lasting for three weeks. After a period of three months, during which all the symptoms had improved, a recurrence took place. The ophthalmoscope showed intense neuritis with haemorrhages into the retina in the right eye, and blurring of the edges of the disc in the left eye. The visual fields were contracted, and the acuity of vision was reduced to $\frac{6}{12}$. In the first instance the patient was probably suffering from syphilitic meningitis or from gummata, and in the second case the disease was also of syphilitic origin.

From a series of experiments conducted upon mediums or "psychic sensitives" for the purpose of determining the physical import of *variable achromatopsia*, Purdon, of Tampa, Fla.,^{19 Feb. 11} concludes: "1. Nervous states, with a tendency to hysteria, may be accompanied by a derangement of accommodation in one or both eyes, indicative of a more general defect of 'attention' on the part of automatic centres of the brain, whereby the elements of sensation are generally combined into higher psychical complexes. Observation with the ophthalmoscope and otherwise led me to the belief that functional inactivity depends rather upon a deficient supply of blood than upon direct inhibition. 2. The existence of this state is a predisposing cause in the manifesting of psychic phenomena, such as are usually shown by respectable mediums under test-condition, while the nose-bleeding and the aggravation of visual defects gave direct evidence of congestion or stasis of blood in the brain, and probably of anaemia in varying and unknown degrees; the latter supposition being supported by the trains of objective nervous symptoms so commonly seen in the case of 'mediums' during 'manifestation.' 3. The actual occurrence of extraordinary psychical events being provisionally granted for

the sake of an application of physiological theory, it appears very probable that the relationship of the cerebral cortex to the muscular system is profoundly modified, and to such an extent that psychical states find other modes of expression than those depending upon the mechanical influence of a visible and tangible intervening substance, the nervous system being thereby placed in a more direct relationship with the space content."

Berger, of Paris,¹⁷³ has observed an instance of *erythropsia* in a very neurasthenic woman, aged 30 years, who had lost her sight by an attempted suicide with a revolver, producing a bullet wound through both orbits. The author believes the erythropsia to have been of central origin, as it occurred almost exclusively at night, when the brain was most exhausted. The patient had other visual sensations. A case of hysterical monocular blindness in a girl 17 years of age, cured by positive mental impressions, is reported by J. J. Chisolm, of Baltimore.⁹ In the differential diagnosis of organic diseases, particularly multiple sclerosis from hysteria, Koenig, of Paris,¹⁷³ June emphasizes the value of the presence of nystagmus, of a permanent regular contraction of the visual form and color fields, of the Argyll-Robertson pupil, associated with a blanching of the temporal half of the disc. Galezowski, of Paris,¹⁷³ Oct., 192 cites an instance of monocular chromatic nasal hemianopsia occurring in an hysterical man; vision was reduced to an unimprovable one-half. No lesion of the fundus could be detected, and the other eye was apparently normal.

Walter, of Odessa,⁵⁴ July has made a valuable contribution to the study of *epidemic hemeralopia*. Men were found to be twice more liable to the affection than women, particularly youth and old age, whilst females showed a greater disposition to it in middle life. The greater number of cases occurred during the fasts, although the disease was not confined to this period. Xerosis of the conjunctiva was not observed as an associated condition in any instance, and only thirteen patients exhibited a low degree of vitality. The disorder had a great tendency to recur, and shows a predilection for certain parts of the world. The casual relationship of fasting and blinding from an excessive degree of light is not as closely allied as the prevailing idea would lead one to believe. The disease is miasmatic in origin, disturbance in vision beginning in the centre of the field and spreading centrifugally. By dimin-

ished illumination, vision sank in an equal degree until it was but one-tenth of the normal. After this, total blindness came on suddenly. Where the disease had persisted for some time, there was a diminished visual acuity in ordinary daylight. Of thirty-four cases examined with the ophthalmoscope, the edge of the disc was found to be hazy in twenty-eight instances. The veins were unchanged, whilst the arteries were somewhat narrower than normal. The changes were in proportion to the duration and severity of the attacks. Therapy consisted in the administration of codliver-oil and the liver of beef. In three instances, where this treatment failed, strychnia was employed with good results.

In the differential diagnosis of ocular affections occurring in hysteria, alcoholism, and locomotor ataxy, Charcot, of Paris, ¹⁷³ _{Dec., '92} lays special stress on the regular concentric decrease of the field of vision, associated with various irregular color-perceptions, which occur in hysteria without any appreciable changes in the fundus, contrasted with the irregular concentric changes in the field of vision, with regular change in color-perception, which are seen in locomotor ataxy. Again, in locomotor ataxy paralysis of the third nerve is common, whilst in alcoholism it is rare to have an isolated paralysis. In hysteria, on the other hand, paralyses are uncommon, the ptosis observed in this affection being due to a spasm of the orbicularis muscle. The author considers the presence of the Argyll-Robertson pupil to be most significant of tabes dorsalis, as he has rarely found it in any other disease except general paralysis of the insane. The author cites an instance of a young alcoholic who presented a series of ocular symptoms which were determined to be of hysterical origin.

Pischl, of San Francisco, ⁹ _{July 29} examined the eyes of a man, 40 years of age, who, about six weeks previously, had taken 30 grains (2 grammes) of quinine in the course of twenty-four hours. Central vision was almost normal, but the visual field was contracted to 5 degrees. The optic discs were pale and their outlines were sharply defined. The retinal vessels were reduced to one-third normal size, and "some were bordered by white lines." Treatment consisted in the hypodermatic use of increasing doses of strychnia and the application of the constant current. In five weeks' time the field for white became almost normal, while that for red increased to one-half the normal size.

Bach, of Würzburg,²⁵⁴ reports an interesting case following *lead poisoning*. There was exophthalmus and ptosis on both sides, associated with paralysis of the rectus internus, paresis of the superior and inferior rectus, and of the inferior oblique on the right side. There was also slight paresis of the opposite rectus externus and of the corresponding superior oblique. The pupils were irregular and the irides did not react to light, accommodation, or convergence. When, however, the patient looked at the examining-finger for some time and his sympathetic was brought into activity, a dilatation of the pupil was observed which lasted ten seconds. The visual fields for white were normal, but were contracted for red and green. There were changes in the vascular system that were suggestive of chronic nephritis. The patient, however, had exhibited evidences of lead poisoning for some time, and the case may be regarded as one of lead intoxication, with symptoms resembling Basedow's disease. Of 150 male employés of a *tobacco-factory*, selected from a total number of 1500, on account of a greater likelihood of exhibiting the signs of tobacco-amblyopia, Dowling, of Cincinnati,³³⁷ Jan. found more or less evidence of the affection in forty-five instances. He is inclined to believe that the inhalation of tobacco-dust is incapable of producing the disease.

In a case of *tabes dorsalis*, observed by Hutchinson, of London,⁸⁰⁶ July monocular paralytic mydriasis preceded other ataxic symptoms by more than three years' time. Galtier¹⁷¹ has employed Brown-Séquard's fluid in a case of gray atrophy of the optic nerve, occurring in a man who exhibited the preataxic signs of tabes dorsalis. As the patient had syphilitic antecedents, the mixed treatment was administered, but without good results. After three months of injection of 3 centimetres (46 minimis), visual acuity was raised from $\frac{1}{10}$ to $\frac{1}{6}$, and the field for white and red became more extended. This is the first instance in which he has seen improvement follow; usually, after a space of three months, the vision either becomes stationary or diminishes.

During a condition of hypnotism induced by ophthalmoscopic examination in a woman presenting symptoms of the earliest stages of *general paralysis of the insane* with optic atrophy, Jeaffreson, of Newcastle-on-Tyne,⁶ Nov. 5, 1922 noted left ptosis and facial paralysis, which disappeared on the patient's awakening each morning.

Suckling, of Birmingham, ² Nov. 26, '92 reports a case of ophthalmoplegia in a woman, 21 years of age, suffering from general motor paresis. Tanner, of London, ⁶ Jan. 21 has observed upward displacement of the pupils in an *idiot*, who, for two years previously, had carried his head flexed upon the chest, with the eyes turned downward and forward. The lower lid covered the corresponding half of the cornea, thus narrowing the palpebral fissure. The author attributes the eccentricity of the pupils to the faulty position of the head and eyes, which allowed the light to act upon the upper part of the iris. The following observations are given by Oliver, of Philadelphia, ⁹ Nov. 11 as expressive of some of the more important and certain of the findings in a study of the relation of the patellar-tendon reflex to some of the ocular reflexes in *general paralysis of the insane*: "1. In some of the cases in the second stage of the disease, especially when the patellar-tendon reflexes were unequally exaggerated, there appeared to be an irregular and unequal spastic innervation of the two irides, causing irregularities in pin-point pupil-forms. 2. In a few cases, especially in the third stage of the disorder, when the patellar-tendon reflexes were unequally diminished, and the pupil size was small and the pupillary shape somewhat irregular, the iris seemed to be but little acted upon by any powerful mydriatic. 3. In many cases, especially in comparatively young subjects, in the third stage of the disease, when the patellar-tendon reflexes were unequally diminished, there appeared to be an unequal paralytic innervation of the two irides; the pupillary dilatation manifesting itself at times, though not as a rule, in the eye with the greater amount of objective optic-nerve-head degeneration and retinal change. 4. In a few cases (especially in men of middle life) in the third stage of the disorder, when the patellar-tendon reflexes were markedly diminished, and when the ataxias were quite pronounced, there were marked temporary asymmetries of pupillary form, one pupil often being quite small and irregular for several examinations, whilst its fellow was large and ovoid or oval. 5. In quite a number of cases, especially in the advanced stages of the disease, when the patellar-tendon reflexes were either unequally exaggerated or diminished, there was a failure of the irides to respond to even major degrees of light-stimulus; this being true not only in those subjects exhibiting a true spastic myosis, but more especially

in those in which, with partial dilatation of the pupil, mydriatics failed to act. 6. In many instances, especially in the older cases, when the patellar-tendon reflexes were, as a rule, unequally diminished, or even lost, there was not only failure of iris response to the strongest light-stimulus carefully thrown upon the retina, but, when obtainable, the irides seemed to fail to react to the various coarse and rough subjective and objective procedures necessary to be used in order to evolve both separated and associated efforts for accommodation and associated efforts for convergence. 7. In some instances in which ciliary-muscle innervation could be satisfactorily obtained, both the spastic excitation and the paralytic innervation found by subjective reading-tests and objective study with the retinoscope seemed to be in direct ratio to the patellar-tendon reflexes as the iridic changes. 8. In quite a number of cases in which there was marked inequality of the pupils, with more or less want of reaction of the irides to light-stimulus, the patellar-tendon reflex on the side of the larger pupil seemed to be the one the more greatly diminished. 9. In a number of instances, especially during the very earliest stages of the disease, when the patellar-tendon reflexes were beginning to lessen to unequal degrees, there often appeared momentary secondary ataxic dilatation of the pupil during exposure to strong light-stimulation. 10. In many cases, especially during the second stage of the disorder, when the patellar-tendon reflexes began to become irregular and inconstant, pupillary inequalities, as expressive of unequal iris innervation and action, became more and more constant."

SECTION V.

THERAPEUTICS AND INSTRUMENTS.

Raezman, of Dorpat,⁵⁷ _{July 22} has experimented with *scopolaminum hydrobromicum*, and finds that it has a mydriatic action that is similar to that of hyoscine, without possessing any of the disadvantages that are common to atropia. He believes that its anti-phlogistic and anaesthetic qualities are far greater than those of the latter drug, while it does not cause increased ocular tension.

In his experiments with *tropacocaine*, Alt, of St. Louis,³⁴⁷ _{June} has found that the instillation of 1 drop of a 3-per-cent. solution into

the conjunctival *cul-de-sac* usually causes momentarily very pronounced irritation, often accompanied by pain and profuse lachrymation, followed by total anaesthesia of the conjunctiva and cornea, coming on within thirty seconds or more, and lasting about six minutes. No general toxic symptoms followed even a subcutaneous injection. It was incapable of annulling the pain attending tenotomies and iridectomies, but with it the application of caustics to the conjunctiva produced less pain than after cocaine. He does not consider it greatly superior to cocaine, except in its rapidity of action. From a series of clinical observations, Ferdinands, of Aberdeen,^{June 24} ² concludes: 1. Tropacocaine is more reliable and deeper in its action than cocaine, and the anaesthesia it produces lasts a little longer. Unlike cocaine, it anaesthetizes inflamed tissue,—at least, more deeply than does that salt. There is complete absence of the haze over the cornea so characteristic of cocaine anaesthesia. This was specially appreciated when needling. The strength of the solution depends on the requirements. For general use 2 or 3 per cent. is sufficient, and a 5-per-cent. solution may be employed with safety when anaesthesia of the deep-seated parts is required. 2. Solutions of tropacocaine made with distilled water keep well and retain their strength for months. One solution (3 per cent.) prepared in January last (six months), although now a little cloudy, has not lost its activity. So far no fungus has been noticed growing in the solutions. 3. With the exception of the one case, in which the 10-per-cent. solution was used, tropacocaine gave rise to no disagreeable symptoms. It practically has no mydriatic action, neither is it haemostatic; but it certainly did not give rise to intense haemorrhage as was the experience of Seifert.

Gould, of Philadelphia,^{Mar.} ¹⁴⁴ has noted swelling of the lids, with erythema of the skin of the back, chest, arms, and legs, in a woman, 30 years of age, after the installation of about $\frac{1}{30}$ grain (0.002 grammes) of *homatropine*.

A case of poisoning following the daily instillation of $\frac{1}{40}$ grain (0.0016 grammes) *duboisine* for iritis is reported by Crouzet.^{Feb.} ¹⁷³ The usual symptoms, with acceleration of the cardiac impulse, increased arterial tension, and muscular feebleness, were present, with a very unusual condition of paraphasia and slowness of speech persisting for two days. Improvement rapidly followed the withdrawal of the drug and the exhibition of sedatives.

In a case of cataract extraction where *iodoform* had been applied freely to the wound, Berry, of Edinburgh, ^{Nov., '92}, found a quantity of the drug in the anterior chamber and several cakes of it adhering to the surface of the iris. Absorption without irritation took place in a fortnight. Priestley Smith, of Birmingham, ^{Apr.}, has seen a case of amblyopia with central scotomata in a phthisical patient, coming on during the administration of the same drug in daily doses of 32 grains (2.07 grammes). The margins of the discs were slightly hazy and there was slight ptosis on the left side. Withdrawal of the drug, with the use of strychnia, resulted in gradual subsidence of the toxic symptoms.

Tiffany, of Kansas City, ^{Aug.}, ¹⁰⁰⁷, has found *methyl-violet* of value in all forms of keratitis, especially in the interstitial types, in suppurative iritis, and in hypopyon. He has seen it retard the progress of a growth supposed to be a melanosarcoma of the choroid, and under its use a glioma of the retina gradually diminished in size. Socor, of Jassy, ^{Nov. 5}, ²²³, condemns the use of interstitial injections of *pyoktanin* in the treatment of malign growths, as he has seen recurrence of the tumor follow its use. He reports a case of epithelioma of the lower lid, where the growth was extirpated and a perfect cosmetic result obtained by taking the flap from the cheek. Darier, of Paris, ^{June 30}, ⁶⁷, states that methyl-blue has no specific action upon chancre or cancer of the lids, but that it has a marked effect upon the morbid tissues. Chromic acid has rendered excellent service in the treatment of certain forms of granular conjunctivitis, and the action of sublimate should not be overlooked in the after-dressings. Recurrences should always be feared in the aged and cachectic. The internal administration of arsenic is often of great value in conjunction with local antisepsis. Dunn, of Richmond, ^{Feb.}, ⁸¹, for the past three years has performed almost all enucleations under *cocaine* anaesthesia, making use of a 4-per-cent. solution, while previous to section of the optic and ciliary nerves he instills a few drops of a 20-per-cent. solution in the region of the optic-nerve entrance. Older subjects require weaker solutions than the young. Following the suggestion of Snellen, Koller, of New York, ^{Jan. 7}, ¹, has obtained complete anaesthesia in iridectomy by subconjunctival injections of 2-per-cent. solution of cocaine. The injection is made at the point of section about five minutes before the operation.

Valude, of Paris, ^{July}, ¹⁷¹, thinks that *formic aldehyde* in a germi-

cidal strength (1 to 500) is superior to corrosive sublimate as an antiseptic by virtue of its greater stability, compatibility with alkaloids, and of its not attacking the metal of instruments.

In regard to subconjunctival injections of *mercury* in diseases of the eye, Grandclément, of Lyons,²¹¹ _{Apr.} concludes as follows: (1) that these solutions are but slightly efficacious in diseases caused by corneal infiltration; (2) that they are much more valuable in diseases of the uveal tract; (3) that they are of no benefit in diseases of the internal layer of the retina. These solutions act not only by sterilizing the cornea and uvea against microbic infection, but also by producing a true local revulsion and permitting an energetic vaso-constriction upon the stasis of the intra-ocular fluid. Chibret, of Clermont-Ferrand,¹⁷¹ _{July} states that the best mode of general treatment of ocular syphilis is the employment of hypodermatics of soluble salts of mercury, especially the cyanide. Subconjunctival injections are valuable additions where the cornea and choroid have been affected. The disadvantages of the hypodermatic method are local pain, diarrhoea, great systemic disturbance, and acute ptalism, whilst the advantages are rapid and intense action and exact dose. Potassium iodide is only valuable in preventing chronic mercurial poisoning. Borlée⁵² _{July 29} pleads for anti-phlogistic treatment in inflammations of the eye, and condemns the subconjunctival injection of mercury.

De Schweinitz, of Philadelphia,⁹ _{July 15} has found that intra-ocular injections of antiseptic solutions not only always cause permanent lesions of the retina or vitreous, or of both, but that they fail to cure or prevent suppurative inflammation produced in the eyes of rabbits. In one instance they appeared to influence a cure in the eye of a dog. In order to remove the danger of infection by collyria, Vignes, of Paris,¹⁷¹ _{Mar.} has had small closed phials of sterile solutions prepared, each one containing about the quantity needed at one instillation. G. E. and E. A. de Schweinitz, Philadelphia and Washington,⁸⁰ _{Sept. 15} have made an extended series of bacteriological examinations of the pipettes and collyria taken from a treatment case used in ophthalmic practice. Solutions derived from the pipettes used for cocaine, eserine, and fluorescine were capable of inducing a growth upon culture media, and collyria of boric acid, homatropine, fluorescine, atropine, and cocaine all produced similar results in varying periods of time. Lotions of bichloride

of mercury and nitrate of silver were found to be innocuous. Infecting the abraded cornea of a rabbit with the agar-agar culture produced by the cocaine and boric-acid collyria, and by solutions from the cocaine pipettes, caused slight clouding of the cornea and moderate ciliary injections, while inoculations of the anterior chamber with the same cultures resulted in the production of purulent irido-choroiditis. These results, they think, furnish additional evidence that unclean solutions which find their way into the anterior chamber, as after operations, are capable of speedily originating a destructive inflammation of the uveal tract, terminating in panophthalmitis. They emphasize the importance of securing perfect sterilization of any lotion, especially of cocaine, which is to be used in a case requiring corneal section, and state that boric-acid solution which is not freshly prepared may be the medium of the most violent contamination. Gould, of Philadelphia,^{9, 192} offers a modification of the dropper in daily use, by making it take the place of the stopper to the bottle.

Based upon a clinical experience at the "Charité," Burchardt, of Berlin,¹⁹⁰ Sept. has found that *chlorine water* in 5-per-cent. solution is the most useful fluid for cleansing the eye. Preparatory to all operations the face is washed with this fluid, care being taken to see that the cilia are carefully cleansed. The instruments are immersed in a mixture of 6 parts of solveol and $\frac{1}{10}$ part lysol in 1000 parts of water. Bandages moistened with chlorine water are suitable after all kinds of operation, except after enucleation, when a large wad of cotton soaked in the same material should be employed. As collodion will keep the dressing in place for two or three days, he uses this when the moist bandage is indicated. Mellinger, of Basel,²⁰⁴ Aug. 15 believes that corrosive sublimate is the most useful of all collyria, and that it is only dangerous where there is some loss of corneal tissue. He has often seen it do much good in the treatment of chalazia. Stroschien²⁰⁴ B. 39, H. 1 believes that the sublimate solution in the strength of 1 to 4000 or from 1 to 5000 is the antiseptic best adapted to ophthalmic surgery. Nuel, of Liége,⁷⁸ May prefers a solution of the same drug in a strength not less than 1 to 2000. The conjunctival sac is thoroughly washed with this solution two or three days previous to the operation, although after the operation is begun the sublimate is not brought into contact with the eye, the irrigation being done with a physiological

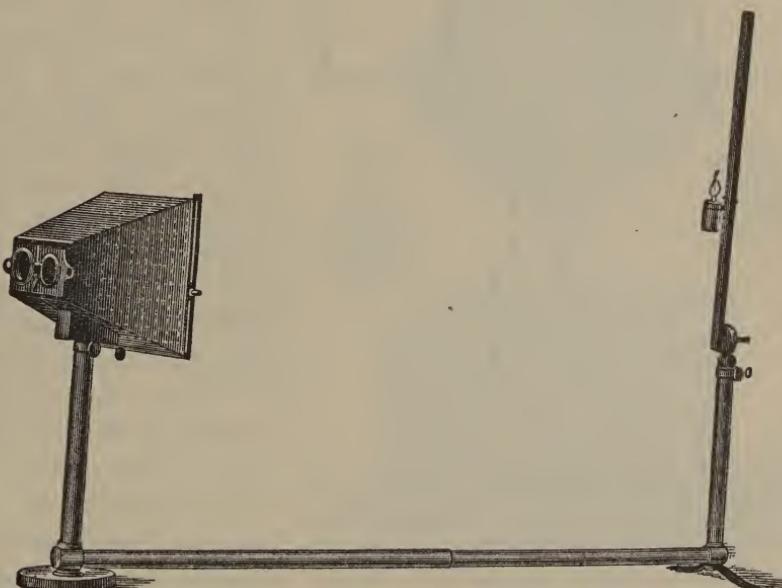
salt solution, this latter being the only fluid which can be introduced into the anterior chamber without disturbing the endothelium. In order to get quick and regular healing, he advocates making the incision well in the corneal tissue. The first dressing, which consists of a pad of sterilized cotton, held in place by a firm bandage, is removed at the end of forty-eight hours. Should the edges of the wound show signs of infiltration, iodoform is introduced and the actual cautery applied. Prior to the operation, the instruments are boiled in a 2-per-cent. solution of carbonate of sodium in water. The dressings are all subjected to heating by steam, and all the collyria are boiled before they are instilled into the eye.

Briggs, of Sacramento,¹⁴⁹ Apr. has found the *constant current* of value in the same class of affections of the optic nerve and ocular muscles as that in which strychnia proves of benefit. He employs a current of 2 or 3 milliampères with the anode placed upon the closed lid and the cathode upon the nape of the neck or in the subaural region. Velhagen, of Goettingen,²⁵⁴ July has studied the effects of the galvanic current upon thirty-nine individuals afflicted with more or less severe disease of the eye. Opacities and pathological conditions in the refracting media were found not to have any effect upon the reaction, nor was there any change in cases of severe retinitis. The reaction, however, was much affected when there was a diseased condition of the optic nerve.

Savage, of Nashville,¹⁰⁰⁷ Feb. has found *poulticing* of great value in all forms of ocular inflammations, other than conjunctival, where there is suppuration. Burnham, of Toronto,⁵⁹ June 17 finds that solutions of *carbolic acid*, in strengths of 1 to 20 and 1 to 40, give more satisfactory results than any similar remedy in the treatment of gonorrhœal conjunctivitis and suppurative affections of the cornea.

Galezowski, of Paris,¹⁷³ Mar. has devised an ingenious instrument, called the *dipolometer*, for measuring the *angle of deviation* in cases of strabismus, well shown in the accompanying cut. It consists of a box-shaped stereopticon, provided with a dark compartment and two eye-pieces posteriorly. In front of each eye-piece there is a groove, into which the correcting-lens and a red glass may be inserted in front of either eye. The anterior portion of the box is much larger than the posterior, and is closed by a plate of ground glass, upon which are marked a number of vertical and horizontal

divisions graded in centimetres. At one metre's distance from the eye-pieces there is an upright bar of the same height as the centre of the glass plate. Upon this is placed a lamp, which can be readily moved upon a metrical scale that is capable of being moved in a plane that is parallel to that of the glass. The patient is seated in front of the eye-pieces, and with both eyes looks at a candle at one metre's distance. Two images are at once seen, and each displacement of the lamp is immediately perceived by the patient and its position noted upon the glass. Two metal rods, one vertical, the other horizontal, can be moved by the patient to the positions in

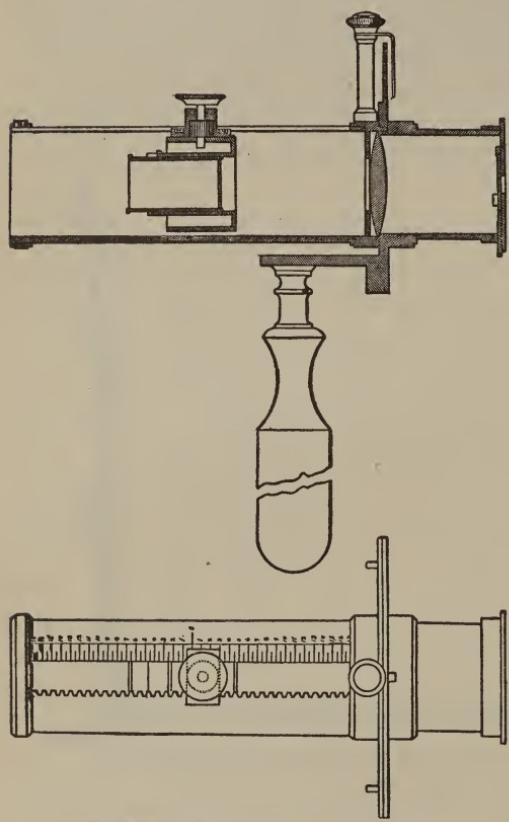


APPARATUS FOR MEASURING DEVIATION IN STRABISMUS. (GALEZOWSKI).
Recueil d'Ophtalmologie.

which the images appear on the glass, permitting ready reading. The instrument does not require the use of a dark room, and may be employed at the bedside.

Mergier, of Paris,^{171 Nov., '92} has designed a *portable optometer*, the details of which are well shown in the illustration on next page. It consists of a convex lens of 20 dioptries, placed in a metallic tube of about fifteen centimetres in length. The tube, which contains the object to be examined, is regulated by a pinion. The object to be studied consists of a series of photographic reproductions one-one-hundredth of the size of the ordinary Snellen

test-type; these, being seen through the lens of 20 dioptries, produce the same retinal image as the ordinary cards when viewed at five metres. There is a movable eye-piece at the anterior extremity of the instrument, behind which is placed a disc containing three diaphragms capable of being rotated into the axis of the opening. One diaphragm is circular, another is composed of a number of



PORTABLE OPTOMETER. (MERGIER.)
Annales d'Oculistique.

small, point-like, perpendicular apertures, whilst a third consists of three or four slits at right angles to the latter. The tube is graded in dioptries and in half-dioptries. The patient looks through the eye-piece. The operator grasps the button and brings the object of the part the farthest separated from the lens into position. If the patient see all the lines equally distinct, he is not astigmatic. The second or third diaphragm is now brought into position until the patient sees but one object. This point will represent the *punctum remotum*. If this

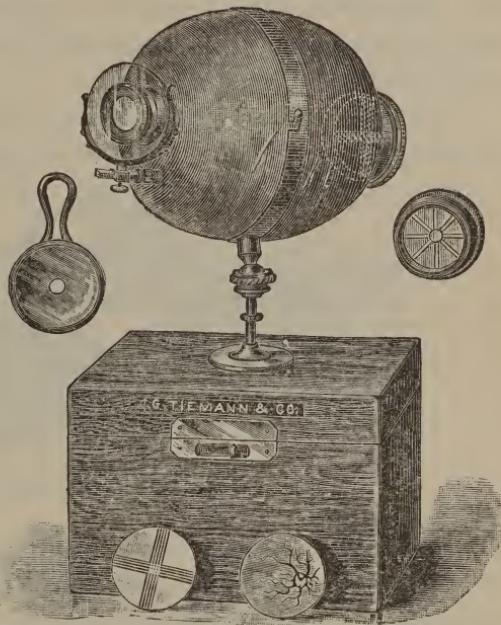
read beyond zero, the

eye is myopic; if under zero, hypermetropic. If the eye be astigmatic, its refraction in the two meridians is carefully measured, the difference representing the amount of astigmatism. After the refraction has been determined, the visual acuity is tested by means of the Snellen tablet already described. By this instrument the author claims to be able to estimate the refraction and the visual acuity at the same time, and to abolish the disadvantages of Donders's method and of Badal's optometer.

By an ingenious *schematic eye* (shown in the cut), devised by Dodd, of Cincinnati, ^{May 18}⁵⁹, all of the forms of refraction can be illustrated. Hunter, of New York, ^{Nov. 12, 192}⁵⁹, has devised a frame allowing of numerous combinations for displaying *test-type*. The letters are arranged upon the four sides of horizontally-placed bars, capable of being revolved. For recording pathological conditions of the fundus, Haydon ^{Jan. 7}⁶ has devised plates composed of superimposed layers of enamel pigments.

To obviate the difficulty of obtaining *proper illumination* in examinations made at the house of the patient, Rolland ^{Nov. 192}¹⁷³ has introduced an ophthalmoscopic lamp which can be packed into a small space and readily carried. A blue cobalt or a tinted glass is used in the central perforation in cases of retinal hyperæsthesia. For examining the ciliary region of the eye, Schwartzschild, of New York, ^{Feb. 4}⁵⁹, makes use of an *aprochromatic sphero-prism* held, base in, at its focal distance from the previously-dilated pupil, and at a point diametrically opposite the part to be viewed. The indirect method of ophthalmic examination is made use of, and the inverted image is viewed through a + 4 dioptre spherical lens placed back of the mirror. Antonelli ^{July}¹⁷ has devised a *scotometer* resembling an ophthalmoscope. The revolving discs contain colored circles, and, in place of a mirror, the apparatus is provided with a movable iris-diaphragm, with an indicator attached, to show the smallest-sized circle of color that can be appreciated.

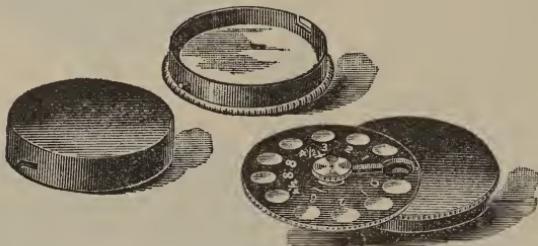
The illustration on next page represents a compact *ophthalmoscope* designed by Howe, of Buffalo. ^{Feb. 317} A Recoss disc with a



SCHEMATIC EYE. (DODD.)
Medical Record.

slot extending from its centre almost to its periphery is placed beneath a circular mirror. A screw which is enlarged and flattened holds the disc when the instrument is in use, so that its centre is nearer the circumference of the mirror, and, in revolving, the lenses come behind the sight-hole. The convex lens is mounted in a rim which fits over the mirror, and the refraction-lenses are protected by a light metallic cap. Under the term *ophthalmometroscope*, Moon, of Philadelphia,¹⁹ has devised an instrument combining an optometer, ophthalmoscope, skiascope, and trial-frame, with means for testing the ocular muscles and subjectively determining the refraction of the eye. The contrivance is light and portable.

For the estimation of the value of lenses, Ritzos,^{171 Mar.} has constructed a new design for a practical *phacometer*, based upon the

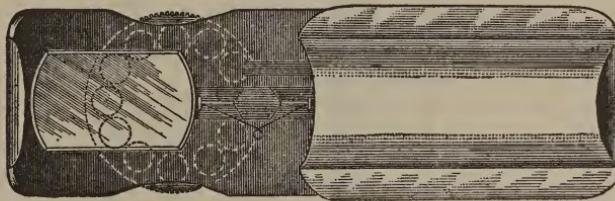


A POCKET OPHTHALMOSCOPE. (HOWE.)
American Journal of Ophthalmology.

principles of skiascopy. The instrument consists of a metallic tube having an opening six millimetres in diameter at each end. The tube is provided with a lens of 20 dioptries at one end, and with one of 30 dioptries at the other, there being a mobile concave disc between these two. To this disc is attached a "cursor," running on a ruled plane on the superior surface of the instrument. According as the juxtaposed lens to be examined is convex or concave, it will give, on skiascopic examination, a lateral or inverted shadow, the degree of displacement of the mobile disc, as registered upon the ruled plane, marking the strength of the lens necessary to produce the change of direction of the shadow. The strength of any lens up to 20 dioptries can be registered upon the plane. A kind of astigmatic dial is rotated around the two openings, and the axis of the cylindrical lens is determined by observing, a little before the complete correction of the lens under

examination, to which meridian the edge of the lateral shadow corresponds. When this edge is concave, the hypotenuse of the two extremities is at the centre of the pupil of the instrument.

The accompanying cut represents an ophthalmoscope devised by Snell, of Sheffield:^{Feb. 25} It is so constructed that the cover for the instrument is convertible into a handle, making the contrivance sufficiently small to be carried in the waistcoat-pocket. A convenient arrangement for the *temporary use of prisms* has been devised by Baxter, of Bangor.^{249 Jan.} The lenses are mounted in a circular frame having deeply-grooved cells. A thumb-screw is attached which permits of the prism being revolved and fixed at any desired angle. A *prism scale* devised by Ziegler, of Philadelphia,^{1018 July} possesses an horizontal scale in black and a vertical scale in red, so arranged that the index line of the one becomes the base line of the other, and *vice versa*. The two scales are graduated for



NEW OPHTHALMOSCOPE. (SNELL.)

British Medical Journal.

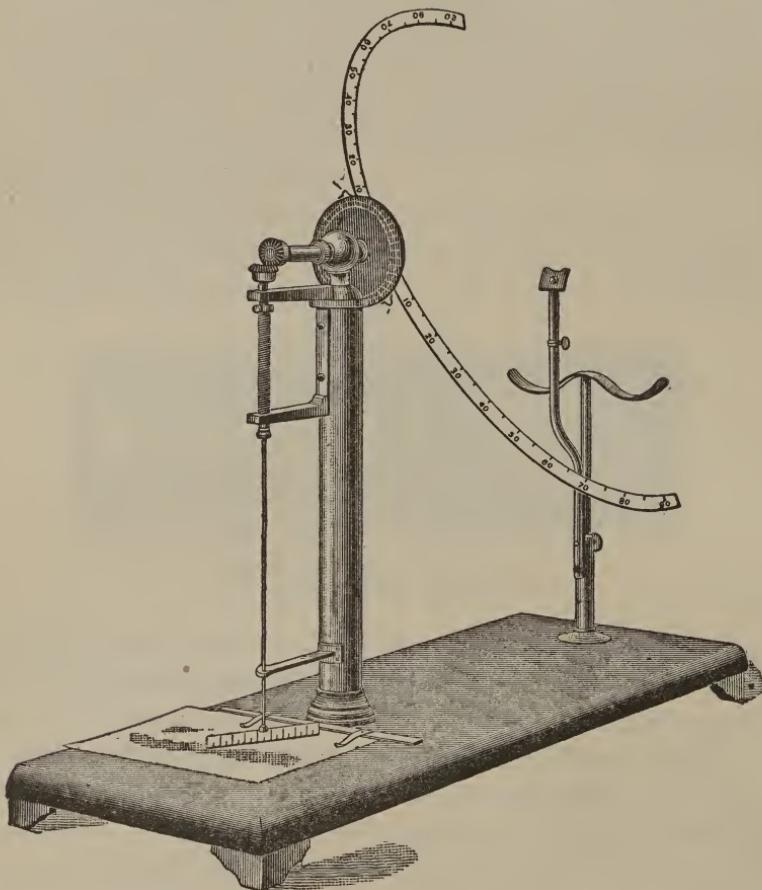
degrees and half-degrees, and are joined in such a manner that the angle of a resultant prism can be readily ascertained before prescribing, or the strength quickly measured after it has been ground.

Giles, of New York,^{249 Jan.} has constructed a *recording device for the perimeter*, consisting, as shown on next page, of a graduated index bar attached to the lower end of a vertical rod connected to the axis of the instrument by beveled gearing in such a manner that every change in the position of the graduated arc is indicated by a change in the position of the index bar. Katz, of St. Petersburg,^{190 Mar.} has devised a perimeter for the light-sense, based upon the principle that the testing of the different degrees of sensitiveness should only be done by absolute light. Ferdinands, of Aberdeen,^{Oct. 15, '92} has invented a *self-registering pupillometer* constructed upon the principle of the iris-diaphragm.

Burnett, of Washington,^{347 Oct., '92} explains the difference in the

arrangement of the mires in the new model of *Javal's ophthalmometer*, whereby crossing of the band in the meridian of shortest radius and highest refraction takes place.

Mathieu¹⁷³ Mar. recommends the adaptation of the glasses proposed by Ferret as protective against heat and chemical rays. These are composed of two layers of glass of different tints, yellow and blue,

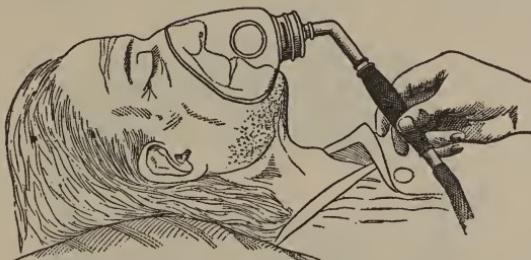


A NEW PERIMETER. (GILES.)
Archives of Ophthalmology.

the one being superimposed above the other. Their one fault is that they are not curved. Bagnérис, of Reims,⁵⁷⁷ Aug. has pointed out that slate-colored glasses have the properties of absorbing red and orange rays, and of shortening the violet spectre, whilst the color of objects is but little changed, except red, which is darkened, and orange, which is shaded. Green and blue are unaffected.

Kaufmann¹⁹⁰ has devised a *new form of spectacles for the relief of ptosis*. The advantage claimed is, that the support to the lids is connected with the spectacles by a spring furnished with a screw for adjustment. By means of this device the lids are permitted to move freely, and the apparatus can be adjusted to any eye.

Lueddeckens, of Munich,¹⁹⁰ has modified the *Junker chloroform apparatus* by making the mask smaller and adding a handle to it below. The hindrance to the surgeon in operating on the

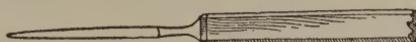


IMPROVED CHLOROFORM INHALER. (LUEDDECKENS.)
Centralblatt für praktische Augenheilkunde.

face is thus done away with, and the apparatus can be kept in position during the entire procedure. The accompanying sketch shows the application of the inhaler.

Nicati, of Marseilles,²⁷⁴ thinks that the point of a *cataract-knife* should have three faces, and that the plane of the dorsal face should be that of the plane of the back of the instrument,—i.e., triangular.

Dunn, of Richmond,⁵⁹ has devised a cataract-knife the blade



CATARACT-KNIFE. (DUNN.)
Medical Record.

of which is twenty-two millimetres in length and tapers very gradually from the hilt to a double-edged point. It is well shown in the accompanying sketch. He has found it of special value in making corneal section for the purpose of iridectomy, where the anterior chamber is very shallow, where there are anterior and posterior synechiæ, where the presence of a dense central leucoma prevents the use of a triangular knife, and where the tension of the ball is greatly lowered. Ring, of New York,⁷⁶ has

invented a *mask* to be worn after extraction of cataract. The contrivance is made of *papier-maché* lined with linen and silk. McCoy, of New York,^{59 Dec. 8} has devised a *shield* (see sketch) for the protection of the eyes after cataract operation. It consists of two oval, convex, light-wire baskets, the rims of which fit comfortably around the orbit, and apparently afford complete security against injury to the eyes.

A “*scissor-action*” *eye-speculum* has been devised by J. P. Parker, of St. Louis.^{1018 July} The instrument is introduced closed, and,

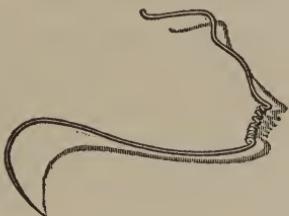


SHIELD FOR PROTECTION OF EYES AFTER CATARACT OPERATION. (McCoy.)
Medical Record.

with the thumb and third finger in the rings, the lids are separated by pressing together the handles, which are then fixed by means of a ratchet operated by the second finger.

Gazépy, of Athens,^{274 Oct. 192} has invented an instrument to be used in performing *canthoplasty*. The instrument is based upon the combination of the blades of scissors with a needle-holder, which is fastened into a groove upon its inferior surface. The author claims that he can operate more rapidly and with less haemorrhage by means of this device than by the ordinary procedures.

The accompanying illustration explains a new device introduced by Meyer, of Würzburg, ²⁵⁴ for the relief of *ptosis*. The upper convex part is caught in a fold of skin and slipped under the edge of the superior orbital ridge, while the under branch is so fashioned that it lies among the cilia at the inner canthus, the nose being used as a brace. Those instruments made of 18-karat gold were found to be the most serviceable. The author has worn one of these contrivances in his own eye for the past five years,



APPLIANCE TO OVERCOME PTOSIS. (MEYER.)
Archiv für Augenheilkunde.

and claims that when it is properly adjusted it is quite comfortable, and does not interfere in the slightest with the normal motion of the lids during the act of winking.

The accompanying cut depicts an instrument devised by Barck, of St. Louis, ²⁴⁹ to aid in *tattooing leucoma of the cornea*. It consists of two concentric-cutting rings, the inner one for mapping out the pupillary space, and the outer one for defining the inner border of the iris-ring. He suggests that the portion of the

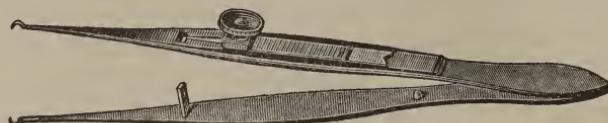


INSTRUMENT FOR TATTOOING CORNEA. (BARCK.)
Journal of Otology and Ophthalmology.

cornea corresponding to the pupil be stained intensely black, the peripheral zone less dense, and that the intermediate area be left untouched.

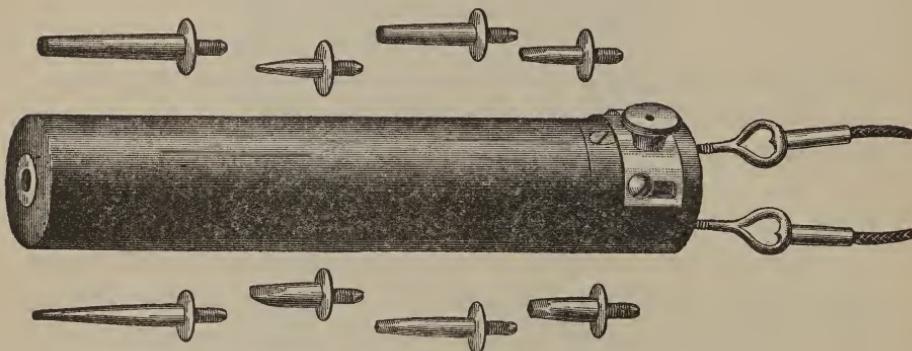
A *forceps* employed by Smith, of Detroit, ²⁴⁹ in performing graduated tenotomy, is illustrated on next page. The muscle to be operated upon is put upon the stretch by the patient turning the eye in the opposite direction, and is then seized in its full width, together with the overlying conjunctiva, by the forceps, the sharp points of which pierce the conjunctiva and grasp the muscle

securely. The muscle is now drawn away from the eyeball and a de Wecker stop-keratome is pushed through the tendon at the position of its insertion into the sclera. No dressing is required.



FORCEPS FOR GRADUATED TENOTOMY. (SMITH.)
Archives of Ophthalmology.

The accompanying cut represents an improved *electro-magnet* devised by Hubbell, of Buffalo. ¹⁰⁰⁷_{Apr.} The advantages claimed for the instrument are its convenient size and shape, lightness, close proximity of the extension-points to the coil, and great power of attraction. Johnston, of Paterson, N. J., ³⁴⁷_{Sept.} has devised a perma-



NEW ELECTRO-MAGNET FOR EXTRACTION OF STEEL. (HUBBELL.)
Ophthalmic Record.

nent magnet for use in removing particles of iron and steel from the cornea. The instrument, as shown in the cut, consists of a cylinder of highly-tempered steel, three inches in length and one and one-half inches in diameter, terminating at each end in a



PERMANENT MAGNET. (JOHNSTON.)
American Journal of Ophthalmology.

conical tip measuring one and one-half inches in length. The magnet is charged by rotating it within the magnetic field of a generator.

An improved *lachrymal director and probes* have been sug-

gested by Jeaffreson, of Newcastle-on-Tyne.^{6 Jan. 14} The distal end terminates in a button-tip to admit of its ready entrance into the punctum. The probes, which vary in form both as to their thickness and as to their extremities, are made of pewter, so as to permit of their being readily bent to meet the exigencies of the case.

The accompanying cut shows a new *curette* devised by Lagrange, of Bordeaux,^{173 Nov., 192} for the treatment of cases of trachoma.

Black, of Denver,^{1018 July} pleads for more general operative interference for cosmetic effect; for instance, in such cases as monocular cataract, strabismus, leucoma, and pterygium. Armaignac, of Bordeaux,^{188 July 30} has introduced a new form of therapeutics in the treatment of granular and lupoid conjunctivitis, namely, *medicated tattooing*. This procedure is performed by injecting corrosive sublimate, in the strength of 1 to 500, into the deeper conjunctival tissues, by means of the ordinary corneal tattooing instrument. The eye is afterward cleansed with petroleum, into which essences



CONJUNCTIVA CURETTE. (LAGRANGE.)
Recueil d'Ophtalmologie.

of mint, anise, etc., have been incorporated. The mucosa is not altered, there are no cicatrices left, and the remedy can be brought into contact with diseased foci so deep that scarification would not reach them. In order to destroy any superficial granulations that might have escaped the needle, he frequently brushes the conjunctiva with corrosive sublimate after the operation. By the employment of a *continuous galvanic current*, Buxton, of London,^{26 Sept. 1} has seen marked amelioration in a case of monocular progressive failure of vision, in an apparently healthy woman aged 26 years, in which all other treatment failed; also in a case of unilateral nystagmus in a child, and in cases in which neuralgic pain in the eyes is a prominent symptom.

SECTION VI.

UNCLASSIFIED.

Silex, of Berlin,^{254 Jan.} has found the *local temperature* in all inflammatory conditions of the eye to be higher than that of the normal

state, the highest being found in iritis; this, however, being below the normal body-temperature. The local inflammation did not produce a *general* increase of temperature in any instance. Diseased eyes were found to have a temperature of 0.98° C. (1.75° F.) higher than the normal. Cold compresses, as usually ordered, increased the local temperature; whereas, when applied oftener and of a greater degree of coldness, the temperature was diminished. Berry, of Edinburgh,²² May 17 points out that the *degree of loss of sight* to an individual cannot be considered as commensurate with the degree of loss of visual acuity as measured by the ordinary standard of subjective examination, owing to the varying degree of vision required to perform the work of different occupations. For a given amount of loss, the distribution of the visual defect over both eyes is less disadvantageous than when confined to one eye. Howe, of Buffalo,⁷⁶ Sept quotes the figures of the census of 1890 to show that there has been an *increase of 3 per cent. of blindness* as compared with the preceding decade. He urges the importance of appropriate legislation for the prevention of this affection.

Jackson, of Philadelphia,⁷⁶ Sept urges the importance of *uniformity in classification* of diseases of the eye for hospital statistics. He favors the adoption of English terms, and suggests the recording of each of the different conditions present in a case under separate headings. Carter, of London,⁶ Oct. 29, 192 has made an analysis of 10,000 cases of disease or disturbance of the eyes in private practice. Of this number, 4003 were instances of either simple hypermetropia or myopia. Of the total number of cases seen, the conjunctiva was affected 879 times, cornea 492, sclera 20, iris 262, choroid 145, retina and optic nerve 871, lens 933, vitreous 164, globe 115, muscles 543, fifth nerve 18, lachrymal apparatus 159, orbit 14, lids 349. There were 176 cases of glaucoma, 2431 of anomalies of refraction and accommodation, and 97 unclassified. Almost 30 per cent. of the cases are recorded under more than one head. Bronner, of Bradford,² Oct. 29, 192 reports a series of 2200 eye-operations performed within the past six years at the Bradford Eye and Ear Hospital under aseptic precautions. The globe was opened in 1753 different instances without the loss of a case from suppuration.

DISEASES OF THE EAR.

By CHARLES S. TURNBULL, M.D., PH.D.,
AND
ARTHUR AMES BLISS, A.M., M.D.,
PHILADELPHIA.

EXTERNAL EAR.

Auricle.—Little that is new has been presented on the subject of diseased conditions of the auricle. Notes have appeared referring to congenital deformities, but operative measures have not been successful. Dench, ⁶⁶ of New York, reports an interesting case of *epithelioma* of the auricle. The mass arose from the internal surface of the base of the tragus, the bony auditory canal being perfectly free. The growth rapidly increased in size, and a part of it, removed by the snare, was found to be characteristic of epithelioma. It was completely excised, and there has been no recurrence. Dench believes that malignant growths of the external ear are more amenable to treatment than the same growths elsewhere in the body, provided that complete excision is performed before there is involvement of surrounding parts. The subject of *othæmatoma* is still open to discussion as to etiology. Field, of London, ²⁴² concludes that these growths are of traumatic origin, and are by no means found among the insane only, but among healthy individuals as well, whose occupation or amusements may subject the auricle to the risk of injury.

Pellizzi, of Reggio-Emilia, ⁶⁸, comes to a similar conclusion as a result of bacteriological studies made upon the contents of abscesses in cases of *othæmatoma*. He finds that streptococci are present, and infers that all cases, in both insane and healthy subjects, result from traumatism, by which agency the cocci are introduced into the parts afterward affected.

Gradenigo, of Turin, ¹¹⁰⁵, ³⁷, V.I,p.67; Sept. reports a case of *symmetrical serous perichondritis*, developed without known cause. The pain attending it was very slight. Its serous fluid contained no micro-

organisms, thus doing away with the hypothesis of abscess. The author believes that this rare affection results from trophic derangement, and presents a certain analogy to a case of spontaneous gangrene, affecting both ears, reported by Urbantschitsch. Reference to *gangrene of the auricles* calls up a case reported by Lockwood, of London.¹¹ The patches of gangrene were symmetrical and resembled the lesions of Raynaud's disease. There was no history of frost-bite, the disease showing in mild weather. The pupils were unequal and did not react well to light, suggesting atrophic nerve-lesion. Neither albumen nor blood-pigment was found in the urine. The treatment suggested was varied,—local application of belladonna, trinitrine tabloids internally, removal of scab, antiseptic plaster, and small doses of opium.

Albespy, of Rodez,¹³⁶ Dec. 15, '92 treats *cysts of the auricle* by electro-cautery applications. The cyst is opened by incision, its contents allowed to escape, and the sack washed with sublimate solution. The walls are then curetted, and an electro-cautery point, made into the form of a small button of platinum, introduced into the sack and the walls seared. The interior is then washed out with sublimate solution and a compress applied, covered with iodoform gauze. The parts heal quickly, and with slight or no deformity.

Renaud, of Bordeaux,⁷⁰ Apr. 30, at a meeting of the Society of Anatomists and Physiologists of Bordeaux, presented a small keloid tumor, removed from the auricle of a girl aged 10 years. The growth had developed after the lobule had been pierced for earrings, appearing at the posterior opening of the puncture. It was proven, by histological examination, to be a true keloid tumor.

Among the few rare conditions reported during the year is a case of *chancroid* of the right auricle and auditory meatus, followed by erysipelas (?) of face and scalp, reported by Hodges, of Galveston, Tex.¹⁰⁰⁷ Jan. The subject was a negro, suffering from gonorrhœa, but free from ulcerations about the genitals. The ulceration within the auditory meatus assumed a phagedenic character and caused much loss of tissue.

Congenital fistulae of the external ear has received some attention from Vauthier,⁶² Mar. who concludes that such fistulae, when anterior to the helix, are usually hereditary; that they are usually unaccompanied by any other anomaly; that they cause very little inconvenience, and that they tend to disappear with age. They

are probably a result of arrest of development occurring in the course of the second month of embryonic life.

Treating of the subject of *eczema* of the auricle and external auditory canal, Chatellier, of Paris,^{37, 11 July, Aug.} recommends the use of a wash of Van Swieten's solution, diluted with three or four times its volume of water. The parts are then dried with absorbent gauze, and dusted, morning and evening, with iodol. This form of treatment is of service in case of "moist eczema." For what the author calls "dry eczema," after using the wash, as above, the parts are dried, and the following ointment is applied: Iodol, 1 gramme (15 grains); lanolin, 30 grammes (1 ounce). If the auditory canal is also involved, it is advised by Chatellier (not by us) to fill the external auditory canal with the following solution: Iodol, 1 gramme (15 grains); paraffin-oil, 30 grammes (1 ounce). A cotton wad is to be applied, so that the oil cannot escape. The application is to be renewed morning and evening. Rohrer^{169 June} has used pyoktanin for this application with success. In acute purulent otitis he finds it of value when applied frequently, by placing pyoktanin-cotton in the auditory canal; in chronic purulent otitis the pyoktanin in substance is to be applied to the tympanic cavity.

EXTERNAL AUDITORY CANAL AND DRUM-HEAD.

Auditory Meatal Reflexes.—In a tubercular patient in whom two points on the posterior wall of the meatus were carious, Bonnier^{37, 11 Mar., July} made out three distinct reflexes: 1. On touching the membrana tympani a reflex irritation was produced, as is normal, at and above the level of the glottis, and a short cough—"tympanic cough"—was set up. 2. Irritation of the denuded spot external and posterior to the tympanum determined a cough of a bronchial character. These two reflexes belong to the vagus. 3. Farther from the tympanum, close to the exterior of the osseous meatus, the reflex aroused consisted sometimes in a hiccough, sometimes in genuine eructation. There was no internal pain provoking a contraction of the diaphragm, and the patient was surprised at the absence of this sensation. The writer accounts for the reflex by the community of origin of the great auricular and the first root of the phrenic, both emerging by the third intervertebral foramen.

Bonnier^{2 Mar. 4} recently reported the case of a *tuberculous* and

syphilitic patient, in whom, together with herpes of the left temporal and frontal nerves, there were six small vesicles on the anterior part of the membrana tympani. Rapid recovery took place.

Foreign bodies in the auditory canal is always a subject well illustrated by reports of cases. The year has not shown anything new in the variety of materials acting as foreign bodies, or in methods of removal. Hennebert, of Paris, ^{July 15}¹³⁶ reports a case operated on by Delstanche, where it was found best to detach the auricle, reflect it forward, separate the cartilaginous from the bony canal, and thus reach the foreign body.

Albespy, of Rodez, ^{Mar.}³⁷ directs attention to the different characteristics of *impacted masses of secretion* due to disease of the ceruminous glands of the auditory meatus, and those due to disease of the epidermic glands. The plug formed in the former case is soft (unless hardened by age), black or yellowish in color, and with a bright surface. It results from hypersecretion of the ceruminous glands, or a lack of sufficient moisture in this secretion. On the other hand, the epidermic plug results always from a chronic inflammation of the external auditory canal; a dry, desquamative otitis, characterized by absence of secretion; and the masses are formed largely from exfoliated epithelium. It adheres closely to the walls of the canal, is solid and laminated, and its removal is thus rendered difficult. Its grayish color has led to the mistake in diagnosis of supposing such a plug to be the surface of a sclerosed drum-head. It is frequently associated with desquamative otitis externa and plastic catarrh of the middle ear. Application of nitrate-of-silver solutions to the skin, followed by salicylated collodion, are recommended after removal of the epidermic plugs.

Tumors.—A series of cases of new growths of the ear are given by Green, of Boston, ⁶⁶ as follows: 1. Epithelioma of the auricle: recovery followed an operation for amputation. 2. Epithelioma of the meatus: in this case the cartilaginous part of the auditory canal was removed, followed by recurrence of the growth and death of the patient. 3. Primary sarcoma of the meatus; removal; recovery. 4. Cavernous angioma of the auricle; ligation of the external carotid; removal; recovery. 5. Angioma of the tragus; removed by dissection, with slight bleeding; wound healed firmly; patient has not been seen since healing of wound. 6.

Angioma of the tympanum. This patient complained of tinnitus, after an attack of *la grippe*. Previous to this attack, he had had two haemorrhages from the mouth. After development of tinnitus, the ear began to be painful. Paracentesis was done, but no discharge followed, and, on two subsequent occasions, was repeated. The last puncture was followed by a profuse haemorrhage from the ear; stopped by tampon. The drum-head had good lustre, was irregular in surface, projected and pulsated in time with radial pulse. Pressure on common carotid reduced pulsations, but did not stop them. Over a period of several weeks, the appearances changed somewhat; pulsation varied in intensity. Pressure was applied to the pulsating membrane, which occupied seat of drum-head, by means of cotton plugs, and the subjective and objective symptoms disappeared, for a time (two months), but returned. The author calls this condition an angioma, but believes it possible that it may have resulted from an aneurism.

MIDDLE EAR.

Operative Procedures.—The various procedures for the removal of sclerotic tissue and ankylosed elements of the ossicular chain have now been in vogue and under observation for a time sufficiently long to have established these methods as a well-recognized department of aural surgery. The uncertainty and dangers which were at first supposed to attend any act of violence to the middle ear caused the majority of aurists to hesitate in adopting procedures of this character. As a result of this not unreasonable timidity, their performance was for a time limited to a very few progressive aurists, who had the courage of their convictions. Among this number, Sexton, of New York, and Charles Burnett, of Philadelphia, deserve the place of pioneers. During the last two years, however, and especially during the year now ending, many aurists have undertaken these methods, and a sufficiently large series of cases have been published to enable the unprejudiced surgeon to form quite exact conclusions as to their value. Before going into this subject more fully, it would be well to state briefly the indications for these procedures, which are still new to the general practitioner, and are, therefore, apt to be not very clearly understood; and the performance of which, on any large scale, has been confined mainly to the aurists of America.

Although originating with German surgeons, to whom full credit must be given, their general application to clinical aural surgery has been carried out on this side of the ocean. In a few words, then, it may be said, that excision is employed, in cases of plastic or sclerosing otitis media, for the purpose of removing masses which prevent the passage of vibrations from the external ear to the inner ear. Such obstructions consist of sclerosed drum-heads, often bound to the posterior wall of the tympanic cavity by inflammatory adhesions, involving a varying amount of the drum-head; of ossicles united into a solid or imperfectly movable mass, by ankylosis of their articulations, by fibrous bands holding these ossicles to the surrounding walls of the tympanum, and, most important, perhaps, of all, the union of the foot-plate of the stapes to the margins of the oval window, or interference with its normal movement by reason of fibrous bands, the results of an inflammatory process. These conditions may result from the slow, chronic, fibrous changes which attend a non-suppurative catarrh of the middle ear; or they may follow at once a sharp, acute inflammatory process, as gout or rheumatism; or may arise in consequence of cicatricial changes after the healing of suppurative otitis media. Excision is employed in cases of *otorrhœa* for the purpose of securing free drainage and ingress to parts lying above or behind the ossicles; or for the removal of carious ossicles or denuded bone, together with other necrotic or occluding masses, such as cholesteatoma, polypi, or granulations.

It is now a generally acknowledged fact, that, in cases of chronic *otorrhœa* which fail to yield to the older and less-radical forms of treatment, it is the surgeon's duty to resort to excision, for the purposes already specified. Abroad, especially in Germany, the surgeon feels justified in exposing the middle-ear cavity by incising the attachment of the auricle, drawing it forward, separating the cartilaginous from the bony canal, and, thus gaining a free field for operation, remove all offending masses. Good results follow this method, and it offers the advantage of enabling the surgeon to drain the mastoid cells and antrum at the same time. In this country, equally good results appear to have followed removal of diseased tissues through the external auditory canal, by means of delicate instruments and by the aid of strong light, the electric head-lamp being found most useful. As regards excision

methods for *sclerotic* cases, it must be confessed that general opinion is far from being so fixed and free from disagreements. The general reader cannot but feel a certain degree of suspicion that enthusiasm for the new methods plays a part—an unconscious part, no doubt—in the long reports of singularly brilliant results. A side-light is thrown on the matter by the occasional appearance of articles which tell a different story, and too much praise cannot be given to the conscientious surgeons who have been quite as ready—perhaps more so—in recording their failures as their successes. Notably among this class of surgeons is B. Alexander Randall, of Philadelphia,¹¹⁹ who, while still performing such operations, guards his statements most carefully. For this reason, we quote from one of his articles reporting a case: “In view of the small benefit observed in the majority of the cases of excision of the malleus and drum-head, I look to the removal of the stapes as being the more-rational measure, and the only one to which I would resort in all appropriate cases, since twenty or thirty such operations by Jack, of Boston, have thus far been without a single unfavorable result, and the improvement in hearing has been most striking.”

It has been found, in instances so many that they cannot be ignored, that the great improvement in hearing and in relief of subjective symptoms, noted after operation, was but temporary. The truth is most difficult to find. No one questions the sincerity or good faith of many enthusiastic writers, yet cases pass from their sight as successes and turn up in another aurist’s office with complaint of failure. Taking the statements which come to us from many sources, and aided by a small degree of personal experience in this line of surgery, it seems just to claim that excision methods are a most valuable addition to our forms of treatment; that they should be limited to cases where the sound-perceiving apparatus is sufficiently intact to perform its functions, and where a faithful performance of the older and simpler methods of mobilization, together with whatever treatment the nares, posterior nares, and pharynx demand, has been thoroughly carried out. We would suggest that the mere use of sprays, variously perfumed, and a puff from Politzer’s bag is hardly a fair test of the more-conservative mobilization methods. Besides procedures directed to opening a stenosed or swollen Eustachian tube, the treatment should include

the removal of all nasal deformities causing occlusion or pressure from contact of masses; the removal of hypertrophied adenoid tissue from the posterior nares, if such growths exist, and the section of enlarged tonsils to such an extent as to free the soft palate and surrounding tissues from their pressure. As a last resort, the operation of excision of the sclerosed masses in the middle ear is then in order. The general practitioner must not be unduly alarmed by the enthusiast's oft-repeated declaration, "Your patient grows worse while you wait!" In reality, your patient has been growing worse for from five to twenty years, and can safely retain his ossicles for a few months longer without materially lessening his chances of improvement from their removal; in the mean time it may be shown that the ossicles can be left untouched. For it is a question, if the chances for many patients to retain a fair degree of hearing and freedom from subjective symptoms are not better when the older methods are used at intervals, than when excision is performed. Take the case of a patient suffering from a degree of middle-ear deafness quite noticeable, yet not causing serious interference with his occupation or social relations. Such cases can almost invariably be improved by the catarrhal treatment and aural procedures for mobilization, already long in use, continued for a varying length of time. The patient can stop treatment for months, and have it renewed at intervals; thus his hearing is maintained without much retrogression. But let this case undergo an excision operation, which gives him temporary improvement only; what is to be done when he returns no better, perhaps worse? With an empty tympanum and absence of drum-head the inflation treatment would be absurd. There is nothing more to excise,—unless it be a cicatricial drum-head, or the stapes, which may have been left behind at the former operation. Except for the cases of plastic otitis media very pronounced, and with no change after proper mobilization treatment, excision should be held in the background.

The newest phase of the excision operation is the removal of the stapes. This procedure was attempted first as a regular operation for the relief of the symptoms attending ankylosis, by Blake, of Boston. ^{Nov., Dec., '92} Frederick Jack, of Boston, ^{'99} soon after operated upon a series of cases which were reported in the ANNUAL for last year. This list has been increased since that report, with still

favorable results. Blake⁹⁹ has written a series of articles treating of this subject in a general way and illustrated by cases. He operates most successfully without general anæsthesia, finding that he could reduce the strength of his cocaine solution from 20 to 2 per cent., "without prejudicing results as far as the accomplishment of local anæsthesia and the effect in preventing bleeding were concerned." This solution was, at first, introduced into the middle ear through the Eustachian catheter, but it was found that cocainization could be accomplished by direct application from the meatus. His efforts to relieve ankylosis were directed, also, to effect this result with the least possible injury to the parts involved. His plan is to expose the incudo-stapedial joint; to note if hearing by aerial conduction has increased after this incision; to note, also, if the foot-plate of the stapes appears to be movable. If there is ankylosis, he disarticulates the stapes from the oval window, and, in doing so, is indifferent about the actual removal of this ossicle. "That the stapes can be extracted from the niche and allowed to remain in the tympanum without injury so long as its blood-supply is secured has been sufficiently proven, and the question very naturally arises, in cases where the stapes is situated very high above the posterior superior margin of the tympanic ring, and with its stapedius tendon correspondingly inaccessible, whether extraction of the stapes without preliminary division of the tendon of the stapedius is not preferable to the form of operation first proposed, in which the division of the tendon precedes the extraction of the stapes." In one case operated upon, the incus and stapes, when released from their articulations, passed out of sight into the posterior portion of the tympanum, where they remained during a period of six months without giving symptoms which called for their removal. In one case reported, there was loss of labyrinthine fluid and resulting vertigo, this latter symptom gradually disappearing after a lapse of twenty-four hours. Blake's results are far from being uniformly favorable. Indeed, the author himself regards this series of cases as experimental, it being his aim to candidly learn what results we can reasonably expect from excision. In many instances there appeared to be no improvement whatever. After learning that Blake performs these operations without ether, a method now employed by others, including one of us, it seems strange to read the statement of Sexton, of New York,⁵⁹ that

otosclerectomy and similar operations cannot be successfully performed under local anaesthesia alone. "It is true that insensitive persons will endure cruel manipulations in the middle ear which would be unbearable ordinarily. Moreover, it must be kept in mind that, even where the utmost caution is exercised, cocaine is liable to cause alarming collapse when applied to the mucous membrane of the ear." The one of us already alluded to has never noted such danger; such pain as is produced has not been unbearable, and the great assistance rendered by a patient who can vary the position of head and body, at the surgeon's request, is of immense help in performing the operations. Sexton does not find sufficient results from the removal of the stapes alone. "The key to the labyrinth in necronectomy," he says, "lies in the drum-head." In a number of instances he has removed the stapes along with the other ossicles, but, in such cases, the results were similar to others where the stapes was allowed to remain.

Charles Burnett, of Philadelphia, ^{May 13} discusses partial myringectomy and removal of the stapes for relief of the lesions of chronic otitis media. Ten cases of excision operations are reported, the patients all being sufferers from plastic catarrh of the middle ear. The drum-head and malleus were not removed in any of these cases. The incus was removed in all except one case. The stapes was removed intact, in one case; was broken and its foot-plate left in the oval window, in five cases; was not removed at all, in four cases. There was decided improvement in hearing and lessening or cessation of all subjective symptoms in all except two of these cases. This improvement did not seem to depend upon the removal or non-removal of the stapes, but upon the excision of the incus. Burnett draws the following conclusions: 1. The operation of partial excision of the membrana tympani (myringectomy of the posterior superior quadrant) is practically unattended by reaction. 2. Reaction not attending this modification of excision of the membrana, regeneration of the membrane is less likely to occur than when total excision of the membrana is performed. 3. Removal of the malleus is not necessary for relief in cases of simple chronic catarrhal otitis media. 4. The removal of the incus alone, or of the incus and the head and crura of the stapes, is followed by results as good as when the incus and the entire stapes are removed. 5. Displacement of the incus and leaving it in the drum-cavity,

where the stapes is removed in part or in whole, is likely to be followed by inflammation of the middle ear. 6. Removal of the incus alone, the membrana, malleus, and stapes being left *in situ*, gives more space in the drum-cavity, increases its resonance, and permits freer access of sound-waves to the stapes, thereby improving the hearing. 7. The relief of tinnitus and aural vertigo is very probably due to the liberation of the stapes from the impacting weight of the incus, forced inward and held so by the retractive power of the indrawn membrana tympani and malleus, as suggested over four years ago. ¹¹⁹ Aug., '88

Politzer, of Vienna,¹⁶⁹ June finds that synecotomy of the stapes—apparently without the removal of this ossicle—is an efficient procedure. Adhesion occurs not infrequently between the shank of the stapes and the lower part of the niche of the oval window. He has attempted the section of such bands in several cases in which a negative Rinné test, increased perception by bone-conduction for a fork of middle tone, and normal perception by bone-conduction for the fork by movement of the hammer, indicated a fixation of the stapes in the oval window.

Politzer exposes the incus-stapes articulation by perforating the posterior superior quadrant of the drum-head with a galvanocautery point, or by means of a triangular flap cut by the knife. For the synecotomy he uses a small knife one-half millimetre in width, one millimetre in length on its lower edge, one millimetre from the point. A knob, corresponding to the convexity of the promontory, prevents the entrance of the instrument into the vestibule. The operation is done without narcosis, cocaineization being sufficient. The patient is placed in a sitting position. Politzer has operated upon 18 cases, in 4 of which the stapes was ankylosed. In these cases there was no improvement gained in the hearing. In 9 cases a slight but only temporary improvement was obtained. In 5 cases there was a decided improvement, both in regard to hearing and relief of tinnitus. No reaction, inflammation or adhesion of the cut edges to the inner wall of the tympanum has been observed. Politzer is guarded in his opinion as to the value of the procedure, believing that a longer trial of the operation and observation of its results are necessary.

Bezold³⁴ May 30 finds improvement after stapedectomy to be of short duration, while the symptoms attending the operation are of a

serious character. The latter statement is from personal experience, we judge, as the reports of most operators do not seem to support this idea.

S. MacCuen Smith, of Philadelphia,^{80 July 15} makes a valuable report of 154 cases of excision, tabulating the histories of all. The results are, with some exceptions, most favorable.

Hamon du Fougeray, of Mans,^{87 June} publishes notes on certain anatomical and surgical points of the tympanic cavity. A full analysis is given of the long series of operative procedures upon the drum-head and tympanum, which are systematically divided as follows:—

1. Operations which involve the drum-head alone: (a) Paracentesis and section of the anterior and posterior folds. (b) Perforation with partial removal; myringectomy. (c) Complete removal.

2. Operations performed upon the osseous plate of the attic:



FIG. 1.

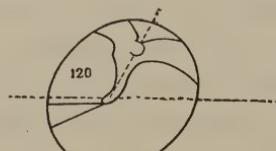


FIG. 2.

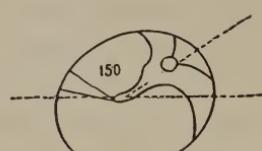


FIG. 3.

DIVISION OF DRUM-HEAD. (FOUGERAY.)
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(a) Perforation. (b) Resection, either simple or with the head of the malleus.

3. Operations performed through the drum-head upon an organ contained within the tympanum: (a) Section of the tendon of the muscle of the malleus. (b) Section of the tendon of the muscle of the stapes. (c) Mobilization of the stapes. (d) Paracentesis of the round window.

4. Operations involving the drum-head and organs within the tympanum: (a) Removal of the drum-head with the handle of the malleus. (b) Removal of drum-head and malleus. (c) Removal of drum-head, malleus, and incus. (d) Removal of drum-head and all the ossicles.

5. Operations performed to remove pathological products: (a) Removal of tumors. (b) Curetting.

In operative work the position of the drum-head in relation to variations of position of the patient's head must be kept in view. The author prefers his own division of the drum-head, into two parts, to the four-part division of Urbantschitsch. By the author's division the drum-head is crossed (see Fig. 1) by a horizontal line passing almost over the round window. The important structures lie above this line, and the angle made by the manubrium of the malleus with this line varies in different positions of the head. Figs. 2 and 3 indicate this variation,—Fig. 2 being the drum-head as seen with the head in a vertical position, while in Fig. 3 the head has been extended more horizontally. The angle of the manubrium with this horizontal line is thus seen to change from one hundred and twenty degrees to one hundred and fifty degrees. This variation of angle must be kept in view while performing operations upon the organs within the superior half of the tympanic cavity, especially when such procedures are performed with

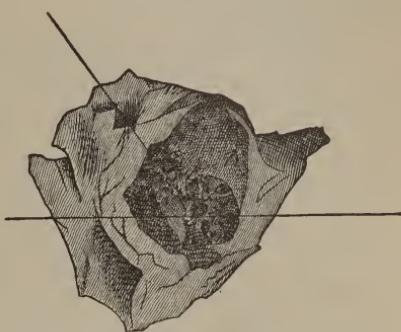


FIG. 4.—VERTICAL POSITION OF THE EAR.
(FOUGERAY.)

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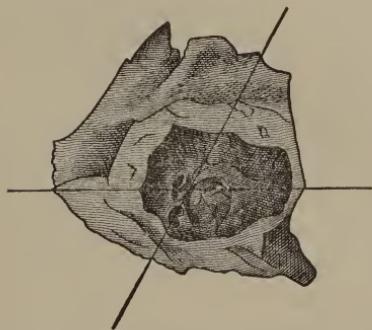


FIG. 5.—HEAD INCLINED BACKWARD
THIRTY DEGREES.

(FOUGERAY.)

Annales des maladies de l'oreille, etc.

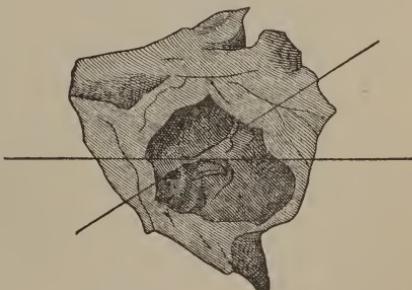


FIG. 6.—HEAD INCLINED BACKWARD
SIXTY DEGREES.

the patient unconscious and in the reclining position. These variations are shown still more clearly by cuts from a preparation made by the author. Fig. 4: In this case, the drum-head being removed, the interior of the tympanic cavity is visible. Fig. 5 is

the same preparation as seen when the head is extended backward thirty degrees. Here the position of the manubrium of the malleus corresponds to its position as indicated in Fig. 2. Fig. 6 shows this specimen with the head inclined backward to sixty degrees.

Regarding the insertion of the tensor muscle, the author has not found it to be constant. In cutting this tendon, it is only necessary to pass the knife slightly above the external apophysis of the malleus; or it can be done by an incision carried beneath the anterior or posterior part of the drum-head. To avoid the chorda tympani, the blade should be carried vertically and parallel to the manubrium. If the edge is inclined backward and above the external apophysis of the malleus, there is danger of wounding the chorda. The author advises, also, that in all sections of the drum-head the operator should avoid incising too close to the manubrium of the malleus. By this care haemorrhage—in some cases abundant and in all cases troublesome—can be avoided.

Hewitt, of New York,⁵⁹ _{Apr. 15} has devised a good form of douche for the middle ear, and also an incus-hook; both instruments appear to be effective.

Non-Operative Procedures.—Garey, of Baltimore,⁷⁴ _{June} reports having obtained very good results from the use of a vibrometer, so arranged as to transmit vibrations to the drum-head. These vibrations can be so controlled as to range from 100 to 3000 per second. Connected with the instrument is a device for the rapid condensation and rarefaction of air in the auditory canal.

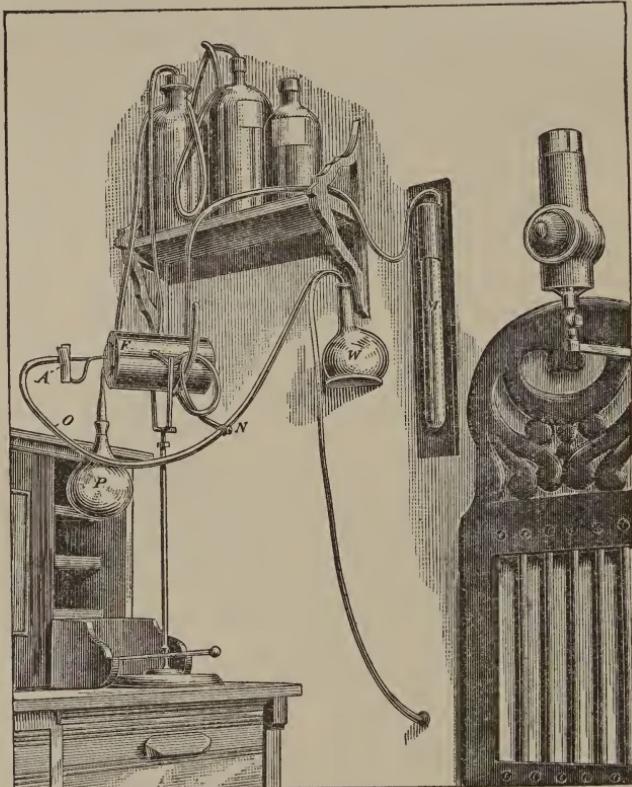
Siebenmann, of Basel,⁶⁶ _{Jan.} reports that his experience coincides with that of Bezold, in finding *pure tubal catarrh* in 9 per cent. of his ear patients. By a systematized course of testing a number of cases, before and after inflation, he has found that certain phenomena are sufficiently constant to be accepted as reliable tests for this condition. The test of bilateral tubal catarrh exhibits the following functional changes: (1) diminution of air-conduction; (2) increase of bone-conduction; (3) localization of the tuning-fork placed on the vertex, upon the more-affected side; (4) shortening of Rinné's test, or its reversal to negative; (5) elevation of the lower tone-limit; (6) reduction of the upper tone-limit.

The first inflation does not notably influence either the increased bone-conduction or the reduction of the upper tone-limit.

On the other hand, it improves in no small degree the diminished air-conduction and the narrowing of the lower tone-limit, without restoring them to their normal standing. After the air-douche, the hearing is increased out of all proportion to the increased bone-conduction. The reason why, after the first inflations, the upper tone-limit and bone-conduction remain unchanged is, in the author's opinion, to be found in the state of *hyperæmia ex vacuo* of the tympanic mucous membrane, and of deeper soft parts, which is always present in tubal catarrh. As a result, the annular ligament of the stapes is rendered rigid, and this fixation continues even after the "aspiration position" of the ossicular chain has been corrected by inflation. It is overcome, later in the course of treatment, by repeated inflations. It is assumed, with Helmholtz, that the portion of the scala vestibuli lying nearest to the oval windows serves to effect the perception of the highest notes. The condition of the stapedial foot-plate, already described, must also affect this portion of the scale. Hence the lowering of the upper tone-limit, as well as the persistence of increased bone-conduction.

Hubbard, of Toledo, Ohio,⁶⁶ has constructed *an instrument for inflation*, based upon the following statement: "It is obvious to all that the ordinary method of politzerization is, in its details, unsurgical, in so far as liability of introducing septic air-dust into the middle-ear tract is concerned. Also, from a therapeutic standpoint, it is highly important that the air used should be not only non-irritant, but properly warmed and medicated; and it adds to the scientific and practical value of this procedure if it is possible to control and record the degree of tension required for thorough inflation." The cut on next page represents the apparatus, which is claimed to fulfill all the requirements suggested in this statement. This device really fills a much-needed want. To use the apparatus, it is first necessary to heat the water in the flask, or pour in hot water, medicated or not, as may be desired. The fluid in the atomizer cup should also be hot. The tubes being now properly connected, a cloud of vapor emerges from the nasal piece. The patient is directed to take a little water in the mouth, and, the nasal piece having been inserted and the other nostril closed, to inhale the vapor until the upper air-passages are filled. As the order to swallow is given the operator should watch the manometer, and with the hand note the degree of pressure in the air-bag.

The cut-off should be kept quite open, and, by careful manipulation of the air-bag, the degree of pressure accurately regulated. Experience soon fixes the range of pressure in individual cases. The Eustachian catheter can be adjusted to this instrument. The aseptic feature recommends itself, and especially in suppurative cases running a natural course, where it is desirable to displace



APPARATUS FOR INFLATING AND MEDICATING THE TYMPANUM. (HUBBARD.)
 A, atomizer; O, cut-off; F, vapor-flask; M, manometer; N, nasal piece; P, Politzer air-bag; W, glycerin wash-bottle.

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the pus from the tympanum and yet not introduce any new septic germs. The air from the large air-tank is cleansed by passing through one or more wash-bottles containing glycerin before it reaches the inflation apparatus. The cut will explain itself, showing the general arrangement of the apparatus.

Purulent Otitis Media.—Schaniavsky⁵³⁰ reports very successful results from the use of dermatol in thirty cases of acute and

chronic purulent otitis, media and externa. The ear is cleansed with a 3-per-cent. boric-acid solution, and dried. A piece of wool, impregnated with dermatol-powder, is then introduced deep into the meatus.

Roberts, of New York,^{59 Jan. 28} has given pyoktanin a trial in cases of suppurative otitis media, and concludes that it is of much less value than the standard remedies now in use, but is worthy of consideration when these have failed.

Lubet-Barbon, of Paris,^{186 Aug.} favors the employment of Stacke's operation in cases of long-standing otorrhœa which do not yield to simpler treatment. Stacke's method, referred to in what we have said regarding the general subject of excision, gives the surgeon full ingress to the middle ear, allowing (1) the removal of the ossicles; (2) curettement of the attic; (3) opening into the antrum for exploration, or for the removal of cholesteatoma.

Beco, of Liége,^{203 Aug., Sept.} in a recent paper, treats of suppurative otitis media and multiple foci of infection from staphylococci. After referring to cases of septicæmia following purulent otitis media, reported by Chauvel, and Le Gendre and Beaussenat, the writer gives notes of a similar case from his own practice. The patient was a carman, 48 years of age, who entered the hospital on account of his rheumatic pains. These were located in the knee-joints. His symptoms were decidedly negative, except these severe pains and a daily variation of temperature, from 37.2° C. (99° F.), A.M., to 39° C. (102.2° F.), P.M. At a later period the general condition of the patient became worse, and symptoms of pyæmia were manifested. At this time an abundant discharge of pus occurred from both ears, suddenly, one morning. The bacteria of this otorrhœa consisted of the staphylococcus albus. The patient died, and in the pus removed from the diseased knee-joint—tibia and femur—was also found the staphylococcus albus. The case, early diagnosed as one of osteomyelitis, was considered to have developed from a chronic purulent otitis media, rendered a focus of infection by the presence of the staphylococcus albus. There is a possibility of error in this opinion, in this case, owing to the fact that the ears had not been examined; so that the existence of chronic purulent otitis media can only be surmised from the sudden appearance of the bilateral otorrhœa.

Katz^{116 15} has obtained excellent results from a 3-per-cent.

chromic-acid solution in chronic suppuration of the middle ear. In acute suppuration, the milder astringents are more suitable. The best cases for the chromic-acid solution are those where the perforation is fairly large, and the exposed tympanic membrane much swollen, or where there is a tendency to formation of granulation tissue. The ear is carefully cleaned from all discharge by syringing, the use of Politzer's air-douche, etc., and then dried. Then about six or eight drops are instilled into the ear with a pipette, forced into the middle ear by pressure on the tragus, and allowed to remain for two minutes, when they are syringed out with warm-water injections. The outer ear is then filled with a cotton-wool plug. This is done three or four times weekly, according to the action. There is, usually, after the third instillation, a marked decrease and in some a complete cessation of the discharge, with considerable reduction of the swelling of the mucous membrane.

A. Courtade, of Paris,¹¹ states that aspiration can be performed by means of Siegel's pneumatic speculum, acting through the meatus. Aspiration through the Eustachian tubes is only practicable by means of a tube so fine that it will become blocked at once by pus of any thickness. Compression of air in the external meatus has been recommended by Lucæ for the expulsion of pus through the Eustachian tube. It is objectionable on account of the frequent narrowing of the tube, and of the tendency to drive irritating materials into the mastoid cavities. It is also apt to lead to unpleasant labyrinthine symptoms.

Bonnier,³⁷ at the meeting of the Laryngological, Otological, and Rhinological Society of Paris, reported the existence of greenish-yellow-colored pus in a case of purulent otitis media, the patient at the same time suffering from icterus. A case is reported by Gerard-Marchant,²⁸⁶ July, Aug. in which the patient manifested the symptoms of cerebral abscess. Upon exposing the dura and probing the brain-tissue no abscess could be found. An autopsy revealed complete absence of any lesion of the petrous portion of the temporal bone, the dura being normal in this region; the existence of acute diffuse meningitis, with points of suppuration in different parts of both hemispheres; complete absence of visceral lesions. The author concludes that the otitis had caused a general septic condition, and that the meningitis was a secondary manifestation.

Wolfenstein, of Cleveland, ^{Nov. 5, '92}, has treated about one hundred cases of acute otitis media by instillations of cocaine, 5-per-cent. solutions. Ninety-five per cent. of all his cases have escaped suppurative inflammation. His plan is to instill 5 or 6 drops of the cocaine solution as often as pain returns. A single medication, the meatus being closed afterward with cotton, will, it is stated, cause pain to cease within ten or fifteen minutes, and the patient will be free from pain for several hours. Ordinary cases of acute otitis media will subside under two or three days of treatment, the drops being instilled about four or five times daily. Inflammation in the naso-pharynx must be treated also.

The writer believes that hearing returns more rapidly, and that tinnitus is greatly diminished and ceases more promptly, after this cocaine treatment than after any other procedure. Excellent results have been obtained in cases of otitis media complicating scarlatina and diphtheria. Merck's crystallized hydrochlorate of cocaine has been found most reliable. The author has never seen any toxic effects result from this method, although he has sometimes used much stronger solutions of cocaine.

J. H. Claiborne, of New York, recommends (1) hot 10-per-cent. solution of cocaine, to be instilled into the ear and retained for from five to ten minutes; (2) hot solutions of boric acid instilled into the ear, while spongio-piline, soaked in hot water, is applied over the whole surface of the external ear; (3) inflation by the bag, and by the continuous method with Eustachian catheters; (4) administration of a drastic dose of Epsom salts. After the acute stage has passed blisters behind the ears might be useful, but they do no good during the acute stage. Paracentesis is not to be attempted, except by an expert.

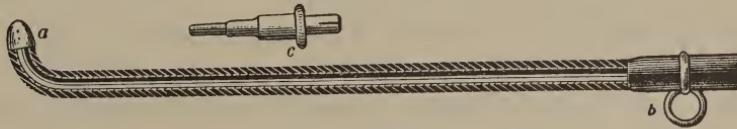
Paracentesis, however, is claimed by Mounier ³⁷ _{Oct. '92} to be of immense advantage in acute otitis media, and should be performed early in the course of the inflammation, in all cases where Politzer's method of inflation has not resulted in lessening the tension within the middle ear, relieving the tinnitus and re-establishing the normal relation between the bone- and air- conduction. Before puncturing the membrane, the external auditory canal is to be rendered aseptic by cleansing it with cotton pledges moistened in 1-to-1000 solution of sublimate, or 1-to-50 solution of phenic acid. Anæsthesia is produced by a 1-to-5 solution of cocaine hydro-

chlorate. The point in the membrane to be punctured should be in the postero-inferior quadrant, (1) because this area is farthest removed from the wall of the labyrinth; (2) because depletion of the swollen tissues here occurs rapidly in structures, where continued inflammation is apt to produce serious consequences upon the ossicular chain and the reduplications of the mucous membrane which surround it. The author believes that early paracentesis has a most beneficial influence in hastening recovery and, consequently, upon the acuteness of hearing.

Importance of the Cushions of Fat in the Lateral Walls of the Eustachian Tubes.—Ostmann¹⁶⁹ finds that the loss of this tissue, through atrophy from emaciation occurring in persons of weakened health or after illness, may cause the development of tinnitus, autophony, and movements of the drum-head synchronous with the respiration. He finds that these cushions close the middle ear to the entrance of sound vibrations from the respiratory tract, and serve to prevent ingress of infecting material from the naso-pharynx.

The Mechanism of Deglutition and Opening of the Eustachian Tubes in a Patient without Palate.—Bonnier¹¹ observed a syphilitic in whom the naso-lobar cartilages had disappeared, a great part of the vomer posteriorly, the posterior third of the skeleton of the palatine vault, and the arch of the palate. The pterygoid apophyses were not palpable to digital examination, in spite of the ease of exploration. There were no pillars, properly speaking, but from the lateral regions of the arch descended a thick, fleshy band, forming a loop by which the inferior and posterior portions were continuous with the arytenoid region, separating the pharynx completely from the epiglottic region. The epiglottis—very small—closed the larynx, and hid it from complete examination. The ordinary mechanism for the production of a vacuum could not be invoked in the absence of the palate, and it was seen to be obtained, after many imperfect attempts at deglutition, by approximation of the nasal alæ to the septum, a vacuum in the whole naso-pharyngeal space being produced at the moment when deglutition was performed. The patient overcame unsuccessful efforts by pinching the nose, when he could swallow with success. Thus the tubes could open during the ordinary phenomena of yawning and deglutition in the absence of the peri-staphyline and palatine aponeurosis.

Spastic Contraction of the Tensor Tympani Muscle.—C. W. Richardson, of Washington, D. C., ⁶¹ Dec. 22, '92 reports this condition in a young patient, 16 years of age, a half-breed Chinese boy, who died from slowly-progressing pachymeningitis. The lad was precocious and quite intelligent until 14 years of age, when cerebral disease began to manifest itself. At this age, too, he began to suffer from ticking sounds produced within both ears and heard plainly by any one standing beside him. The ticking in each ear was entirely independent of that in the other, the two seldom or never pulsating synchronously, the sounds in the right being more rapid than those in the left ear. They were not synchronous with the heart's action. These sounds, after persisting for two years, had produced a most injurious effect upon the patient's physical and mental condition. Examination of the ears showed the drum-heads to be greatly retracted, but movable, except the manubria, these being firmly attached to the promontories. Hearing was normal. The



EUSTACHIAN ELECTRODE. (FRED. WHITING.)
New York Medical Journal.

nasal and pharyngeal cavities were normal; nor could any movements be observed, in the palatal or pharyngeal muscles, to account for the partly rhythmic sounds heard in the head. The ticking could be made to lessen under the influence of inflation, by means of catheters, becoming less after each pressure of the bag. The muscular clickings ceased after a course of treatment consisting in these inflations, and continued during a period of about six months. The pathology of the spastic contraction in this case seems to be one of central origin, and the cessation of the sounds was due more to the destruction of function of the nerve supplying the tensor muscles, occurring in the course of the cerebral disease, than to the efficiency of the inflation treatment.

Eustachian Electrode.—Fred. Whiting, of New York, ¹ Dec. 10, '92 has devised the instrument illustrated in the accompanying cut, useful in those very common conditions of atrophy or sclerosis noted about the mouths of the Eustachian tubes and vault of nasopharynx. The negative galvanic current produces a local conges-

tion of any mucous surface to which it is applied, unattended by the formation of cicatricial tissue. It appeared possible that the establishment of such a congestion might antagonize, or at least retard, the progress of that atrophic process, one manifestation of which was the annoying tinnitus. The instrument is very simple in construction and application. As seen from the cut, it resembles, on superficial inspection, an ordinary Eustachian catheter with a small bulb at the distal and a projecting metal socket for the reception of the connecting battery-cord at the proximal end. The electrode really consists of a hollow silver tube terminating in a bulb (*a*) at one end and in an expanded extremity at the other. The tube pierces the bulb so that a current of air can be transmitted through the electrode as through an ordinary catheter, in place of which it can, of course, be used, the object being purely diagnostic; the expanded extremity (*b*) receives the post of the metal socket (*c*), by means of which the contact is made; the whole of this metal skeleton is inclosed in a hard-rubber envelope, giving the completed instrument the appearance of a bulbous Eustachian catheter.

The hollow silver tube performs a twofold function, acting primarily as a conductor of the electric current, and secondarily as an air-channel, by means of which the Eustachian tube is inflated; it admits as well of easy cleansing in case any mucus or foreign matter shall enter it.

The application of the instrument is very simple, and, as it is a catheter, is equally exact; its introduction into the naso-pharynx is accomplished after the usual manner employed with the ordinary catheter. The presence in the Eustachian tube is determined by connecting the ear of the operator with that of the patient and sending a blast of air through the catheter so that it is heard through the otoscope. The position of the electrode having then been made certain, the positive pole of the battery is introduced, by means of a slender sponge electrode, into the external auditory canal and the current applied by putting the metal post of the electrode, constituting the negative pole, into the socket intended for it.

MASTOID.

During the year much has been written concerning mastoiditis and its treatment, yet there is very little in all the reports

of cases and of post-mortem examinations that can add to what we already know regarding the causes, dangers, and proper treatment of this most serious complication of aural disease. The consensus of opinion is still in favor of prompt surgical interference, if the early symptoms of mastoid involvement do not yield to simple anti-phlogistic treatment. The opinion is, also, very generally held that, except in cases of cholesteatoma,—fortunately, comparatively rare in this country,—mastoid inflammation can be prevented from developing by prompt and rational treatment of acute cases of otitis media; while, in the chronic, purulent cases, the removal of necrotic tissue and carious bone will, in the vast majority of cases, prevent mastoiditis, or hasten the cure of this condition, if already developed. In operating for the free opening of the mastoid cells, Stacke's operation—separating the auricle from its attachment, drawing it forward, dividing the cartilaginous from the bony part of the auditory canal, thus reaching the fundus of the ear—offers, perhaps, the most complete means for opening into the cells, removing necrotic masses in the middle ear, and establishing free drainage. The older and simpler methods of a Wilde incision, exposure of the mastoid process, and perforation of the outer walls of the cells are still in vogue, and the results following are, perhaps, quite as satisfactory as are those following the more-complicated method of Stacke.

Hermann Knapp, of New York,⁶⁶ discusses the various conditions included under the head of *otitic brain disease*. The chief symptoms of meningeal irritation, he states, are headache; occasional nausea, vomiting, and dizziness; moderate increase of temperature; some acceleration of the pulse. The two latter symptoms, though mostly present, seem to depend more upon the virulence of the primary disease, the otitis, than on the meningeal involvement. Thirst, loss of appetite, and constipation are mostly complained of, but are not characteristic. Percussion of the skull is either painless or painful only above and behind the auricle. Differential diagnosis between meningeal irritation and true meningitis is difficult. The practical question of whether, when, and how to operate is here of paramount importance. Simple anti-phlogistic treatment is to be initiated before considering the advisability of an operation.

The practical question at the beginning of an inflammation

of the middle ear is what, under equal severity of the general symptoms, are the local changes that, more than others, give rise to brain complications. The two following may be confidently pointed out: (A) The attic affections and (B) the perforation of the medial side of the mastoid process.

Considering the former complication (A), we find that the pus, seeking other outlets than through the drum-head, may open in three ways: (a) upward and outward, into the pneumatic spaces of the squama above the ear; (b) backward, through antrum, into the mastoid process; (c) straight upward, through the tegmen tympani, into the middle cranial fossa. The author illustrates the first subdivision by recounting a case of acute suppurative inflammation of the attic; paracentesis of the drum-head; spontaneous and artificial perforation of the outer table of the squama; recovery. The second subdivision, where suppuration passes through the antrum into the mastoid process, is the most common. In most cases spontaneous perforation of the outer table of the mastoid occurs, and a post-aural abscess is formed. The third subdivision is the most dangerous form of all, though not so frequent as the preceding ones.

(B) The second group of cases, distinguished by their gravity and their tendency toward intra-cranial complications, is that in which the pus seeks an outlet through the middle (inner) side of the mastoid process, the so-called Bezold perforation. A case illustrating this condition is detailed, in which perforations of the bony meatus occurred; deep incision was made, and recovery resulted. In a second case of this nature there was attic disease; mastoid and head of sterno-mastoid muscle swollen. A large opening into the mastoid was made, and the patient recovered.

Meningeal inflammation may be recognized when, in the course of otitis media, with its manifold symptoms, the headache becomes persistent, is followed by attacks of nausea and vomiting, dizziness, drowsiness, delirium or stupor; at first acceleration, later retardation, of pulse, and rise of temperature, dry tongue, thirst, and constipation. The lethal issue is commonly preceded by spasms in the extremities and coma. Meningitis threatening, the otorrhœa should be encouraged by warm ear-baths and cold applications (Leiter's coil the best), applied day and night, behind the ear. The canal must be kept free from pus. If the symp-

toms continue, and especially if otorrhoea stop, the mastoid should be opened without further delay. The meningitis of such cases may not be general, but due only to congestion and œdema of the surrounding parts.

Three cases of extra-dural abscess are reported. Case I. An acute otitis media, chiefly of the attic; headache, nausea, dizziness, and some stupor. Later, the mastoid was swollen and tender. An elliptical opening was chiseled into the bone, fully one inch deep; no pus; four days later there was free suppuration from the opening and from the ear; temporary relief; return of grave symptoms, with rise of temperature to 105° F. (40.6° C.); death. The attic was found to be full of pus. There was purulent leptomeningitis of left temporal lobe and the lateral ventricle. Collections of pus were found on the inner side of mastoid, especially in and about the foramen lacerum. Case II. Caused by sea-bathing; pains in forehead, right ear, and occiput; drum-head red, and upper part bulging; no fever; paracentesis relieved pain and gave vent to a copious discharge; symptoms returned in six weeks; pain in right occipital region, with fluctuation and swelling; large incision made to the bone and a quantity of creamy, not offensive pus liberated; bone was denuded, but smooth; a spontaneous opening, four centimetres wide, had formed, extending into the cranial cavity; drainage was good, but patient showed evidence of meningeal abscess during two months of treatment, and died five months after the onset of the disease. It was found that the inner table of the mastoid was wanting; cavity filled with pus, which spread along the outer surface of lateral sinus to fistula in bone; abscess in cerebellum full of greenish pus. Case III. A counterpart of Case II, but terminating in recovery.

Encephalic abscess is of frequent occurrence. In two-thirds of the cases the abscess is situated in the temporo-sphenoidal lobe; in about one-fourth, in the cerebellum; in 3 or 4 per cent., in both these locations at the same time. Exceptionally, it is in the frontal or occipital lobe, in the pons Varolii, the cerebellar peduncles, and the centrum ovale. Diagnosis is difficult, the symptoms having little that is characteristic. As a rule, the lesions of the tympanic cavity proper and the attic produce abscess in the temporo-sphenoidal lobe; those of the mastoid, cerebellar abscess. Pachy- and lepto-meningitis and sinus thrombosis are found combined

with encephalic abscess, mostly in consequence of the abscess, not infrequently as its cause.

The symptoms of sinus thrombosis are: accelerated pulse, high and sometimes rapidly-varying temperature, chills, headache, stupor, loss of appetite, and constipation. The diagnosis is certain when, besides these symptoms, a cord-like or round swelling appears medially and in front of the upper part of the sternomastoid muscle, which is hard and painful on pressure, and frequently terminates abruptly about three centimetres below the jaw, where the external facial vein empties into the external jugular. Extension of the thrombus into the sinuses of the other side causes similar appearances there, and may be very misleading as to diagnosis, simulating swollen lymphatic glands. The author illustrates these conditions by reporting a case in which there was marked sinus thrombosis and pyæmia, cure being effected by an external opening into the mastoid cells. Having thoroughly freed the cells from pus, the author desisted from going deeper, remembering that recovery from purulent sinus thrombosis and pyæmia is quite possible when the source of suppuration is controlled. This patient recovered. It is the author's advice, first, and above all, to remove the source of the suppuration, then to act according to the indications present, or, if these are not clear, wait for further developments. He suggests that the aural surgeon should not only be perfectly familiar with the methods of diagnosis and the surgical treatment of otitic brain disease, but should also be competent and prepared to perform the necessary operations.

J. E. Pauzat, of Rennes,³⁷ in a valuable paper on osteomyelitis of the temporal bone as a complication of suppurative inflammation of the middle ear, reaches the following conclusions: 1. Osteomyelitis of the temporal bone exists as an acute, subacute, or chronic condition. 2. The development and relative frequency of this affection can be explained by the fact that the micro-organisms causing osteomyelitis exist normally in the secretions of suppurative otitis media. 3. From a clinical point of view one can recognize (*a*) a form of acute osteomyelitis involving the entire pyramid of the temporal bone, the mastoid, or, at least, its internal wall, and the neighboring part of the occipital bone; (*b*) many varieties of osteomyelitis, acute or subacute, are limited, as the affection attacks the antero-superior part of the mastoid, the entire

mastoid, the bony part of the auditory canal, etc. 4. The prognosis of osteomyelitis depends upon the infectious character of the disease. Subperiosteal or subdural abscess, phlebitis of the sinus, and septic infection are the natural consequences. 5. In the case of the temporal, as in the case of other bones, trepanation forms the basis of surgical treatment.

Otto Koerner, of Frankfort-on-Main, ⁶⁶ _{Apr.} has collected various scattered cases from medical literature illustrating the propagation of affections of the tympanum through the carotid canal into the cerebral cavity. The middle ear is connected with the carotid canals by two small nutrient vessels through the osseous wall between; small veins pass thus, also, to the venous plexus surrounding the carotid, within its canal, and connected with the sinus cavernosus. The osseous wall is at times extremely thin, containing large interstices, allowing the carotid walls to adjoin the tympanic mucous membrane in their entire extent. The author cites cases from medical literature illustrating the possibility of the extension of morbid processes by these tracts to the carotid and the meninges.

Allport, of Minneapolis, ⁶⁶ _{Apr.} describes similar conditions in a long series of cases of purulent brain-deposits and phlebitis and thrombosis of veins and sinuses following ear disease.

Roosa, of New York, ⁹⁹ _{Nov. 17, 92} adds another case to those already reported of wounding of the lateral sinus during an operation for opening the mastoid cells. After the cells had been laid open by a trephine, the Bowman probe was employed for enlarging the space. The patient was afflicted with pulmonary phthisis. The wound was immediately closed by compresses. During the course of the after-treatment there were symptoms of pyæmia, but the case progressed to a favorable termination.

B. Alexander Randall, of Philadelphia, ⁷⁶⁰ _{June 7}, in reporting fifty cases of mastoid operation, states that he prefers the hand-gouge to the chisel and mallet. It is safer, though slower, and can be carried through the hardest bone. Within the mastoid, the spoon and burr are the safest instruments for carrying the opening inward, forward, and slightly downward to the antrum, which should always be encountered without going deeper. After the operation the dressings should be simple, the free incisions being narrowed or closed by sutures.

Grunert³⁴, July 3, regards cholesteatoma as retention masses, their involvement of surrounding parts resulting from their growth and pressure rather than from direct infiltration. Their occurrence, he states, is far from uncommon. During five years of clinical work, he has found cholesteatomata in about 17 per cent. of aural patients. The period of development seems to range between 15 and 30 years of age. The removal of these masses is best effected by freely opening the cavity in which they are contained, and maintaining this opening until there can be no doubt that every particle of the growth has been removed and that there is no tendency to recurrence.

Siebenmann, of Basel, ²¹⁴, Oct. 15, 1902 approves the method employed by Stacke, of laying open the posterior wall of the bony part of the external auditory canal into the spaces filled with the cholesteatomatous mass. He thinks it best, however, to lay open the cholesteatomatous cavity from both sides, and maintain a permanent communication through it into the auditory canal and into the opened mastoid cells.

Sprague, of Providence, ⁹⁹, July 27, has devised an excellent substitute for the Leiter coil. It consists of a rubber bag having an opening in one half, made to fit around the auricle. The bag can be filled with hot or cold water, and covers the tissues over mastoid and above and in front of auricle.

Caldwell, of New York, ¹, July 15, calls attention to the usefulness of transmitted light as a means of diagnosis in cases of suspected suppurative mastoiditis. An electric lamp of two or three candle-power is placed well within the external auditory meatus, the room in which the examination is conducted being thoroughly darkened. The mastoid cells are thus illuminated with a ruddy glow. If suppuration exist, this glow will not be perceived, as the fluid or tissues will prevent the transmission of light.

INTERNAL EAR.

Hessler²⁰²³, No. 35; June 5 divides cerebral abscess, as a result of suppurative otitis, into primary and secondary; primary are those in which no fistulous communication exists between the middle ear and the abscess; secondary are those in which the inflammation of the middle ear is transmitted to the bone and, following various channels to the outer surface of the dura mater, loosens the latter

and leads to the formation of an abscess: these are the most numerous. In 53 cases of cerebral abscess, 41 were secondary and 12 primary. Extra-dural abscesses may be produced in three ways, viz., by direct propagation of the tympanic suppuration to the dura mater; by periphlebitis; in the third group the abscess is developed simultaneously with the suppuration in the middle ear. Symptoms of compression observed in cerebral abscesses are wanting in extra-dural abscesses. Of 41 cases of secondary abscess of the brain, 14 were cured by operation; 27 died. Of 12 cases of primary abscess of the brain, 3 were cured by operation and 9 died.

An interesting case of consecutive necrosis of both cochleæ and death from meningitis is reported by Max.¹¹ _{Apr.} The patient, a man 33 years of age, had had otorrhœa since childhood. Active inflammation began about six months before Max saw him. Seven months after the symptoms had developed on the right side, the right cochlea was thrown off; three months after the appearance of symptoms on the left side, the left cochlea was discharged. Death resulted from meningitis. Koener and Wild, of Frankfort³⁴⁴ _{Dec., '92; Apr.} report a new case of diabetic caries of the temporal bone. The nature of the case was confirmed by operation. U. Pritchard, of London,⁵ _{June} gives the histories of two cases of cerebral abscess resulting in consequence of chronic otorrhœa, in which operations were performed, followed by the patients' recovery.

Grubert⁵ _{June} reports two cases of cerebral abscesses, one of which followed aural disease, was located in the left cerebral hemisphere, and was about the size of a one-mark piece. The otitis from which it had resulted occurred in a young recruit who had deliberately inserted some kind of acid into his ear with the intention of producing injuries that might enable him to escape military service. The author states that similar cases are not uncommon among young recruits.

Ménière's Disease.—Tsakyroglous, of Smyrna,³¹² _{Nov., '92} states that in the treatment of this disease he relies upon quinine,—sulphate, valerianate, or hydrobromate,—especially in the chronic forms, and combined, usually, with ergotin in equal dose, namely, from 0.6 to 1 gramme (9 to 15½ grains) daily. In the well-known apoplectic type of the disease he finds quinine superfluous, but iodide of potassium of great use. Pilocarpine and antipyrin have failed.

In slight cases, and in vertigo arising from ear disease, he has generally found quinine to be curative. Roméo Mongardi³⁷ reports three cases of Ménière's disease cured by the administration daily of three powders containing each 3 grammes (46 grains) of bromide of potassium, and three pills,—valerianate of iron, 1 gramme ($15\frac{1}{2}$ grains); opium, 25 centigrammes (4 grains); extract and powder of cascara sagrada, q. s. ad pil. xij. The cure was permanent. The superiority of this method over the cinchonism suggested by Charcot consists in (1) the remarkable improvement of the hearing, (2) the disappearance of the vertigo after the first day's treatment, and (3) the permanent disappearance of the titubation. John Gay, of London,² reports a case of Ménière's disease cured by 3-grain (0.2 gramme) doses of sodium salicylate, given thrice daily and continued during a period of about one year.

Audition Colorée.—Alfred Binet⁵³ believes that this phenomenon is not simple transference of sensations, but is psychological in its nature, and is induced by the imagination of the subject. It is an interesting fact, this being the case, that, in studying the statements of different individuals who possess this peculiar faculty, there appears to exist a certain uniformity in colors for the vowel sounds. The shades of these colors vary greatly with different individuals, and depend often upon the pitch or intensity of tone used in giving the sounds. Claparede, who has given this subject much attention, has prepared for the author a table, resulting from his inquiries, embracing one hundred observations: A is black; E, blue; I, red; O, yellow; U, green. Jules Millet's list makes A black; E, yellow; I, white; O, red; and U, green. In examining more closely the source of the phenomenon it is observed that color, although it may derive a general tint from the timbre of the voice, and, consequently, from the individuality of the person, depends more particularly on the words pronounced. Each word has its proper color, or, rather, colors; for certain words have five or six. In pushing this analysis farther, the color of the words, it is found, depends on that of the letters comprising it, and that, consequently, it is the alphabet that is colored. Finally, a last observation is that consonants only have pale and faded tints, and that the coloration of the language is directly derived from its vowels. With very few exceptions the latter is true for all subjects.

DEAF-MUTISM.

J. K. Love, of Glasgow,²¹³ has studied the pathology of deaf-mutism, examining 175 deaf children, inmates of the Glasgow Institution for the Deaf and Dumb. The children were tested by a large bell, a large tuning-fork, and the human voice. Sometimes Politzer's acoumeter was used, but for deaf-mutes this is not a test of much importance. Thus tested, the children were found to divide themselves into :—

1. Those stone-deaf or having no aerial hearing	9
2. Those hearing very loud sounds,—shouting, etc.	81
3. Those hearing and distinguishing the voice :—	
(a) Vowels only	20
(b) Consonants and words	13 }
	33
Disqualified for testing because of youth, idiocy, etc.	123
Dumb, but hearing perfectly	49
	3
	175

Of the 9 totally deaf, by far the larger number were cases of congenital deafness. It was found, also, that of those who could hear and distinguish the voice, much the larger number were cases of acquired deafness. A conclusion, at variance with that drawn by most authorities, must therefore be here drawn that congenital deafness is much more severe than acquired deafness when cases are examined in class. The causes of acquired deafness were found to be, in half the cases, primary disease or injury in the brain or internal ear, without apparent disease of the middle or external ear.

Measles and scarlet fever were found responsible for 13 cases, and examination of the ears, together with the history, made it clear that these diseases may cause deaf-mutism either by primary mischief in the internal ear or by communication of disease from the middle ear. Sixty-one cases of normal membrane were found amongst the 175 children; 32 showed suppurative disease, and nearly 80 catarrhal changes. The pharynx was diseased in most of the cases.

A. A. Bliss, of Philadelphia,⁹ has presented a general report of an examination of 415 young deaf-mutes, in regard to the nasal chambers, ears, and organs of phonation. The 415 pupils are grouped into three classes: (1) 303 sign-language pupils, instructed only by means of signs; (2) 91 oral pupils,

trained in oral language; (3) 21 "oral failures," pupils of the oral department who have failed in acquiring this method. The serious lesions which were most commonly found were located in the posterior nares and pharynx. Among the 21 oral failures, these conditions, consisting of enlarged adenoid masses and hypertrophied tonsils, were much more frequent than among the 91 successful oral pupils. As several of the "oral failures" improved in their ability to acquire speech after removal of the obstructing masses, it would seem wise to examine all deaf-mute children upon their entrance into training schools. When such abnormalities are found, the removal of these masses will undoubtedly give the

	Group 1.	Group 2.	Group 3.	Total.
Plastic otitis media, limited as already explained . . .	75	20	16	111
Adherent and immovable drum-heads	94	28	3	125
Very feebly movable drum-heads	43	12	4	59
Atrophic drum-heads	2	0	0	2
Engorgement of manubrial vessels and pinkish tint of drum-head	6	3	1	10
Calcareous deposits in drum-head	14	2	0	16
Double perforations with otorrhœa	9	5	3	17
Single perforations with otorrhœa	10	5	1	16
Cicatrized perforations, many of them covered with new membrane	32	13	3	48
Double impactions of cerumen	14	5	0	19
Single impactions of cerumen	15	7	2	24
Atresia of external auditory meatus	2	0	0	2
Undeveloped auricles with absence of auditory meatus . .	1	0	0	1
Foreign bodies	6	0	0	6
Desquamative otitis externa	4	0	0	4
A slight trace of hearing	6	17	2	25
Hearing on contact only	62	6	10	78
Fair hearing	0	2	0	2

pupil a more favorable chance of success than if the condition is ignored, not recognized, or improperly treated. Even among oral pupils who acquire a certain proficiency in speech in spite of the presence of such growths, the voice is naturally thick and unpleasant, while the work of teaching such pupils is more difficult for the instructor than in cases where the organs of speech can perform their functions unimpeded by tonsils which press against the base of tongue, walls of pharynx, and soft palate, or by enlarged lymphoid masses obstructing the post-nasal space. Abnormalities of the nares were found to be quite common in all the classes, as shown in the accompanying table. Among the causes

for deaf-mutism, scarlet fever was found to be the most frequent. Heredity was noted in a fair number of cases. The parents were relatives in 24 cases; were deaf-mutes themselves in 7 cases; 94 of the pupils had other deaf-mute relatives. The table on preceding page gives the appearances noted in connection with the drum-head and the middle-ear cavity, nares, posterior nares, tongue, palate, pharynx, and larynx:—

The origin of deaf-mutism, among the 303 sign-language pupils, dated from birth in 105 cases; acquired in 178; unknown in 20 cases. Among the 91 oral pupils the origin was, from birth in 22 cases; acquired in 65 cases; unknown in 11 cases. Among the oral failures, these conditions were from birth in 10 cases; acquired in 11 cases. Deformities of the nares consisting of hypertrophied turbinates, of exostoses or deflections of the septum, causing partial or complete occlusion, were very common in each of the three classes of pupils, the largest percentage, however, being found among the oral failures. The general result of this examination was to emphasize the necessity of considering purely mechanical obstruction and deformities as a potent cause for failure in oral language, in very many instances, while, at the same time, nothing was found to mitigate against the theories already held regarding the central or cerebral causes of deaf-mutism. It was manifest, however, that we need not always look so deeply for the causes of complete failure among oral pupils, or for the frequent inability to acquire anything better than a mumbling, unintelligible form of phonation. The following tables give the causes for deafness, as stated by relatives of the pupils, the personal and family histories, and the findings in nares, tongue, palate, tonsils, pharynx, and larynx:—

PERSONAL AND FAMILY HISTORY.

ORIGIN OF DEAF-MUTISM.	Group 1.	Group 2.	Group 3.	Total.
From birth	105	22	10	137
Acquired	178	65	11	254
Uncertain	20	4	0	24

Causes of deaf-mutism given without the division in separate groups:—

	Cases.		Cases.
Spotted fever	43	Cholera infantum	1
Scarlet fever	66	Shock	1
Measles	17	Mumps	1
Meningitis	29	Bronchitis	1
Typhoid fever	5	Catarrhal fever	1
Pneumonia	2	Sun-stroke	1
Diphtheria	2	Otitis media	9
Malaria	2	Whooping-cough	2
Small-pox	1	Teething	3
"Colds"	13	Croup	1
Convulsions	10	Eczema	1
Black fever	3	Unknown (exclusive of 137 pupils credited as being deaf-mutes from birth)	49
Traumatism	9		
Spinal meningitis	5		
Inflammation of bowels	2		

		Group 1.	Group 2.	Group 3.	Total.
<i>Nares.</i>					
Deformities, consisting of deviated septa, exostoses, hypertrophied turbinals, causing partial or complete occlusion of one or both nares	65	14	4	83	
Posterior hypertrophies of turbinals	21	1	2	24	
Impactions of middle turbinals against the septum	14	3	0	17	
Synechial bands between the septum and lower turbinals	2	2	0	4	
Sclerosis of mucous membrane in the anterior nares	35	7	5	47	
Sclerosis in posterior nares	13	8	0	21	
Atrophy of nasal mucous membrane	20	2	0	22	
General catarrhal condition due to vasomotor paresis without deformities	13	3	0	16	
Adenoids in vault of pharynx, causing partial occlusion of this space or pressure upon the Eustachian openings	57	14	8 ²	79	
<i>Tongue.</i>					
Abnormally short frenum	24	0	1	25	
Hypertrophy of the lingual tonsil worthy of note	12 ¹	1	0	13	
<i>Palate.</i>					
Abnormally high, narrow, and gothic-arched	8	0	2	10	
Deflection of raphe from median line, most frequently to left side	6	0	0	6	
Double uvula	2	0	0	2	
Relaxed and pendulous soft palate	2	0	0	2	
<i>Tonsils.</i>					
Large tonsils filling the spaces between the faucial pillars of their own sides of the throat, but not adherent to these bands, or not causing serious occlusion or pressure upon surrounding parts	32	16	1	49	
Tonsils greatly hypertrophied, diseased, and causing pressure upon palate or tongue, and greatly occluding the faucial space	18	5	4	27	

¹ Six of these were in pupils between 14 and 22 years old; the other six in pupils under 14 years of age.

² These eight cases all occurred in subjects between 12 and 19 years old.

	Group 1.	Group 2.	Group 3.	Total.
<i>Tonsils.</i>				
Adhesion between tonsil and faucial pillars, the tonsil being encapsulated	30	6	5	41
Narrowing of fauces by broad posterior pillars with high attachment to the pharyngeal walls	11	0	0	11
<i>Pharynx.</i>				
Simple hypertrophy of mucous follicles	23	3	2	28
Sclerosis of mucous membrane with follicular hypertrophy	9	6	0	15
Simple sclerosis of mucous membrane	55	20	5	80
Atrophy of mucous membrane	8	1	1	10
Venous engorgement worthy of note	22	2	3	27
<i>Larynx.</i>				
Epiglottis abnormally depressed	14 ³	2	0	16
"Infantile" epiglottis	2 ⁴	0	0	2
<i>Vocal Bands.</i>				
Apparently normal in color and ordinary movement . . .	83	63	12	158

³ Only four being in pupils under 14 years of age.

⁴ Both being in pupils over 14 years of age.

T. S. Owen, of Omaha,¹⁰⁶ Sept. has published a most valuable report of a similar series of examinations of the ears and upper air-passages of one hundred and thirty-five deaf-mutes. The hearing power and pathological changes of the drum-heads are shown in the following table. Contrary to the general belief, that, in the congenitally deaf, lesions of the labyrinth, auditory nerve, or brain are the most frequent causes of the deafness, the author finds, as shown in the table, that the lesion at least began in the middle ear in a large percentage of the cases. The gross lesions of the drum-head in those deaf from scarlet fever and cerebro-spinal meningitis show that in the majority of cases the disease first manifested itself in the middle ear, and that the internal became affected secondarily. The author tabulates, also, his findings in the nose, pharynx, and larynx. It is interesting to note the prevalence of hypertrophy of the lymphoid structures of the fauces and naso-pharynx, as characterized by adenoid vegetations, a large percentage being found among the oral pupils. This paper also calls attention to the importance of these lesions of the upper air-passages, not only on account of their injurious effects upon the middle ear, but also to the impediment they offer to the physical development and oral training of the deaf-mute.

Learning.

- Aérial and bone conduction on one or both sides
- Bone conduction alone on one or both sides
- Neither bone nor aérial conduction
- Doubtful

Opaque	
Retracted	
Feebly movable	
Aherent and immovable	
Calcareous deposits in	
Perforate with otorrhœa	
Cicatricial	
Absent with otorrhœa	
Neoplastic	
Atrrophic	
	Congestion of manubrial vessels
	Congestion throughout
	Impaction of cerumen
	Foreign bodies
	Desquamative otitis externa

One became suddenly deaf at 10 years of age. Two, cause unknown, at 3 and 4 years. Four, no record of cause. Two, unknown sickness, at 6 months. One, unknown sickness, at 1 year. One, unknown sickness, at 3 years.

One, unknown sickness, at 3 years.

	Manual Class.	Oral Class.	Aural Class.	Total.
<i>Pathological Changes in Anterior Nasal Cavities.</i>				
Inflamed and tumefied inferior turbinated worthy of note	71	33	31	135
Inflamed and tumefied inferior turbinated with incipient hypertrophy, causing partial or complete occlusion of the cavity	11	6	9	26
Hypertrophic and oedematous inferior turbinated, anterior portion	10	3	8	21
Posterior hypertrophies of turbinate	10	1	3	14
Hyperplasia of middle turbinated with impaction of the same against the septum	7	0	3	10
Atrophy of the nasal mucous membrane	5	3	3	11
Deformities, consisting of deflections, spurs, etc., of septa	3	6	0	9
Rhinoliths	15	0	11	26
	1	1	0	2
<i>Pathological Changes in Post-Nasal Cavities.</i>				
Adenoids, causing more or less occlusion of the cavity	15	10	5	30
Membrane inflamed and hypertrophic	14	8	12	32
<i>Fauces.</i>				
Hypertrophied tonsils on one or both sides, encroaching more or less upon this space	16	9	5	30
Hypertrophy of lingual tonsil	1	3	1	5
Bifurcated uvula	1	0	0	1
Mycosis tonsillaris	1	1	0	2
Hypertrophy of follicles of pharynx	13	10	7	30
Atrophy of mucous membrane of pharynx	1	1	0	2
Lingual varix	3	0	0	3
<i>Larynx.</i>				
Overhanging epiglottis	3	1	2	6
Other abnormalities of larynx, consisting of paresis of muscles, thickened and irregular or attenuated vocal bands, etc.	15	1	5	21
Uncertain	16	3	2	21

Mygind, ⁶⁶ _{Oct., '92; Mar.} ¹¹ profiting by the fact that the government of Denmark has, since 1817, concerned itself with the registration and education of the deaf-mutes in that country, has analyzed, in a most interesting and instructive manner, the statistics obtained. It was only in 1879 that returns in the present complete form were inaugurated, and he confines himself to the date relative to the period between 1879 and 1890. Among points of interest are the fluctuation in the number of deaf-mutes from year to year, the greater number of male than female deaf-mutes (the early mortality of female deaf-mutes is stated later on). A very large increase in the number registered took place between 1870 and 1875, which

could not be explained by any epidemic of measles, scarlatina, or typhoid, but by one of cerebro-spinal meningitis. Many interesting points in regard to the social relations of deaf-mutes are discussed. Not a single child born in the marriages of deaf-mutes was of itself deaf and dumb.

Henri Nimier, of Paris, ³⁷ May calls attention, in an article on the study of the geographical distribution of deaf-mutism in France, to the increasing number of deaf-mutes found each year among the conscripts.

Urbantschitsch ⁸ _{No.29; Sept. 9} has made observations upon a number of deaf-mutes who, by methodic exercise, not only regained the faculty of hearing vowel sounds, but also acquired the ability to hear and to repeat whole sentences. Some of the cases, upon first examination, appeared totally deaf, hearing neither through the air nor through the bones of the skull. The restoration of hearing to an apparently totally deaf person obviously implies that there cannot have been actual deafness, but only an inability to properly interpret acoustic impressions. A development of the auditory sense was equally a result of the exercises, sounds that were previously not at all heard being readily recognized and differentiated. The exercises consisted in indicating by sign or symbol the sound to be made or the letter to be spoken. As at times they proved quite fatiguing, they were at first given for half an hour daily, subsequently for an hour, preferably without the use of a speaking-trumpet.

DISEASES OF THE NASAL CAVITIES, PHARYNX, LARYNX, TRACHEA, AND OESOPHAGUS.

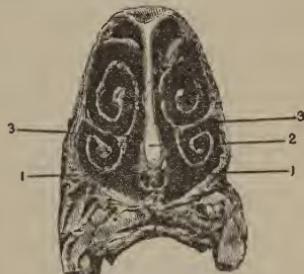
BY CHARLES E. SAJOUS, M.D.,

PARIS.

NASAL CAVITIES.

Anatomy.—Jacobson's organ was the subject of two papers, both bearing mainly upon its comparative anatomy. Meek²⁷⁷ studied it in the *Crocodilus porosus*, in which it only occurs in the form of a rudimentary trace, throwing, therefore, but little, if any, light upon its anatomo-physiological and pathogenic attributes in man. Raugé,²⁸⁶ on the contrary, selected the sheep and the ox, in which Jacobson's organ is well developed, and may always be found. The annexed cut, a perpendicular section through the superior maxillary of the sheep, shows the situation of both organs in that animal at the lower portion of the septum. Although not so well marked in man, it nevertheless occurs in the form of a *cul-de-sac* about eight and one-half millimetres above the floor of the nose, and twenty-three millimetres from the naso-labial junction. Although its orifice is seldom larger than one millimetre, Kœlliker was always able to trace it in the cadaver. Is Jacobson's organ, as thought by Voltolini, the starting-point of the perforating ulcers and thickenings in the portion of the septum in which it is located? Further histological studies are necessary to elucidate these points.

In three cases of catarrhal disorder of the nasal cavities, in which painful excoriation of the skin around the nares formed an important feature, Walker Downie, of Glasgow,²⁷⁷ observed that, although the strip of skin between the two nostrils was of average



JACOBSON'S ORGANS IN THE SHEEP. (RAUGÉ.)

1, transverse section through Jacobson's organs;
2, septal cartilage; 3, section through the turbinate bones.

Archives inter. de Laryngologie.

breadth, the mucous membrane immediately within appeared to be greatly swollen, to such an extent, in fact, in one case, as to almost completely block the lower half of each orifice and to seriously impede nasal respiration. Each prominence being found to be hard and freely movable, Downie dissected the parts and removed from each side a small cartilage resembling in shape, though smaller, the arytenoid cartilages. The base, in its greatest part, was about one-quarter of an inch broad, and the length from base to apex about three lines. The excoriations did not recur even under the stimulation of local disorders. A description of these cartilages removed could be found in none of the works examined by the author.

Physiology.—According to Wurz and Lermoyez²⁸⁶ nasal mucus not only serves to mechanically arrest the irritating particles contained in the atmosphere, but it plays a much more active rôle by destroying the vitality of a large number of pathogenic bacteria. In the case of the anthrax bacillus, for instance, contact with mucus during three hours caused death of the spores. This bactericide action of nasal mucus showed itself in almost all varieties of microbes, the intensity of the effect produced alone presenting a certain degree of variation. An interesting article on the subject was also contributed by J. Macintyre, of Glasgow.⁶ Braislin⁴⁵¹ observed that the nasal cavities in the negro were broader, while presenting much less depth than is the case in other races, demonstrating the inadaptability of the black race to cold climates, and probably explaining its greater susceptibility to influences giving rise to pulmonary disorders.

Etiology of Colds.—Schenk⁵⁰ has investigated the effects of warmth upon micro-organisms. He finds that bacteria examined in a hanging-drop preparation move toward the point at which, by means of a special contrivance, the temperature is highest. That this movement is a vital phenomenon, and not the result of a mere flowing of molecules toward a point, is proved by the fact that it is absent when fine granules of sepia are observed in place of bacteria. Upon this observation Schenk bases a theory of ordinary catarrh. The principal facts noted by him and the speculation based thereon may be summarized as follows: 1. Warmth excites movement in micro-organisms; they tend toward the centre of warmth (thermotaxis). 2. Thermotaxis is a

vital phenomenon of bacteria ; it is manifested even when the difference of temperature between two given points is only 8° to 10° C. (14.4° to 18° F.). 3. Single organisms illustrate this tendency in greater degree than those united in chains. 4. Ordinary colds may be arranged in two groups,—those due to bacterial infection and those independent of this. In the former there is a well-marked interval (incubation period) between exposure to cold and the onset of the malady ; in the latter the disease follows quickly upon the exposure. 5. When a person enters a cold room, air-bacteria tend toward his body as toward a focus of warmth. 6. Thermotaxis is one condition necessary to the development of an infection cold ; the second is penetrability of the skin or mucous membrane to microbes, or some possible circumstances permitting their entry into the body. The penetration of skin and mucous membrane has been shown by various experimenters. In conclusion, it seems possible that some varieties of cold are traceable to air-bacteria, acting under certain conditions of temperature.

Hydrorrhœa.—Several cases of this affection have been reported during the year, most interesting of which is that of Lichtwitz, of Bordeaux,^{25 Dec., '92} in whom the serous nasal flow had existed intermittently for twenty-nine years, complicated with sneezing fits, lachrymation, and photophobia, and during the last seven years intense pain at the root of the nose, on the right side of the forehead and right parietal bone, pruritus over different parts of the body, great difficulty to open the eyes after sleeping, a sort of transient hemianopsia, and, finally, a few convulsive attacks with loss of consciousness. All these troubles were considerably improved by puncture of the right frontal sinus, followed one year later by complete cure after the elimination spontaneously of very abundant gelatinous matter from the nasal cavities. Lichtwitz shares Bosworth's opinion, that the secretion is due to vaso-constrictor paralysis of the mucous membrane of nasal and accessory cavities, and that it is probably due to reflex action originating in one of the sinuses, the trouble being due in his case, therefore, to the lesion in the frontal sinus.

Of the three cases reported by Bean, of St. Paul, Minn.,^{1 Dec. 10, '92} the symptoms were abated by the removal of polypi and the internal administration of strychnine, belladonna, and camphor in the first case, McMunn's elixir and bromide of sodium in large

doses in the second, and removal to California in the third, demonstrating, in the author's opinion, that no line of treatment can be laid down. Cocaine is contra-indicated owing to its liability to produce, in these cases, the very effect it is calculated to combat, while its influence upon the general nervous condition is pernicious. Outside of the cases produced by traumatism and polypi no favorable result is to be expected from local medication. Cases were also reported by Beausoleil ²⁵_{Feb.} and Keiper. ¹_{July 22}. The latter cured his patient by means of a 2 grains (0.13 gramme) to the ounce (31 grammes) solution of atropia spray, used three times daily.

Oedematous Rhinitis.—Akin to the above affection is that termed by Mulhall, of St. Louis, ⁸²_{June 17} oedematous rhinitis, which consists in a serous infiltration of the connective tissue overlying the inferior or middle turbinate bone. It is intermittent in character, and may be general or local. In one case the condition resembled a cyst, causing intense pain, lachrymation, and a flow of thin serum. The swelling obstructs the nasal respiration, and may be migratory in character, acute or chronic. When punctured with the bistoury, serum slowly exudes, and cocaine has little or no influence in causing the mass to shrink. The condition may occur in connection with bronchial asthma, but in the majority of cases asthma is absent. In Mulhall's opinion the affection is a neurosis, although it stands apart from those morbid conditions caused by an extrinsic excitant, as rose-cold, etc. In most cases there is a history of hepatic derangement, and the disease is probably of biliary origin. As regards treatment, spraying, etc., is contra-indicated. Scarification may be of benefit. In chronic cases, existing deformities of the nose should be corrected. The principal efforts should be directed toward improving the condition of the alimentary canal.

Fibrinous Rhinitis.—The papers upon this subject, published during the year, have contributed but little to the elucidation of this still-obscure disease. While Eulenstein, ⁶⁹_{No. 36} basing himself upon the fact that fibrinous exudates of different bacteriological nature may be found in other regions of the respiratory tracts, considers that we are not authorized to grant the disease an identity of its own, Strazza, of Florence, ⁵⁰⁵_{Jan.} (report of Corr. Editor Massei) reports two cases—one in a child 8 years of age, the

other in a man of 38 years—which seem to support this view. In the first case the Klebs-Loeffler bacillus was found; in the second a streptococcus was observed, which presented neither the character of erysipelas nor of pyogenes. Basing himself upon the difference between these bacteriological signs, he prefers to call it “infectious rhinitis,” forgetting, doubtless, the inevitable confusion that will arise between the form in question and the so-called “infectious colds,” which Hill, of Cambridge, ^{Nov. 5, '92} graphically describes in the following words: “Last Sunday an old member of the college spent one day at my lodge instead of returning to his house because he had such an awful cold, which he had caught from a friend three days before it had made its presence felt. In the evening we did some photo-micrography together, and I wondered, as we sat nose to nose, how long it would be before the germs which he was sowing upon my mucous membrane would produce a crop. On Wednesday evening (three days later) I began to exhibit symptoms of an ordinary infectious cold, which has run its usual course, producing painful inflammation of the soft palate, hard palate, upper part of the pharynx, nasal cavities, and larynx, in the order named.” Not only is there considerable variation in the forms of microbes found, but in cases presenting the same bacteriological attributes the virulence of the manifestations may greatly vary. Thus, Abbott, of Philadelphia, ^{May 13} found that cultivations from the nasal membrane of one little patient showing the symptoms of “fibrinous rhinitis” revealed this bacillus in large numbers and of normal virulence, as evidenced by the fact that inoculations upon guinea-pigs caused death within forty-eight hours with pathological lesions characteristic of these inoculations. But from a sister of the same patient, affected with the same disorder, cultivations proved, on inoculation, to be devoid of pathogenic properties. The same thing occurred in Park’s six cases, ^{June 11} the bacilli cultivations possessing only a low degree of virulence. Abbott suggests that the bacillus varies in intensity, sometimes presenting a complete absence of pathogenic power. As regards the total absence of the Klebs-Loeffler bacillus in some cases the difficulty of finding it must be taken into account. Goris, of Brussels, ^{Oct. 37} for instance, only found the bacillus after four careful examinations. Stark, of Kiel, ^{No. 42, '92} could not find the Klebs-Loeffler bacillus in three cases observed by him, one of the cases

following pleuritis fibrinosa and the other pleuro-pneumonia ; while Abel ⁵⁰_{v.12, No. 24} found the diphtheria bacillus in the membranes of some cases, and Fränkel pneumococcus in that of others. The former bacillus was also found in two cases reported by Birkett, of Montreal. ²⁸²_{June}

Notwithstanding these conflicting results, the fact nevertheless remains that in many of the cases the diphtheria bacillus can undoubtedly be isolated. The recommendation of Stamm, ¹⁵⁸_{v.14, H.3, 4} that the disease should therefore be classed among diphtheritic affections until proven benign, merits due consideration. Furthermore, as shown by Abbott, ⁹_{May 13} the treatment which is profitably employed in pharyngeal and laryngeal diphtheria is often used in these cases with benefit. Patients suffering from this disease should be isolated from healthy individuals. They rarely present constitutional symptoms, and their importance is therefore usually overlooked. Masucci ⁶⁸⁰_{Apr. 10} insists upon the importance of isolation and of a rigorous antiseptic treatment. An interesting case is reported by J. Dunn, of Richmond, Va. ¹_{Aug. 23}

Sendziak, of Warsaw, ⁵²⁰_{Nos. 34, 35} reports a case of fibrinous rhinitis which followed a systemic toxæmia resulting from wound of the chin during the act of shaving. The cut became covered with an exudation after a few days, the glands of the corresponding side of the neck taking part in the process by becoming enlarged. A week later acute coryza of the right nasal cavity began, soon followed by the formation of pseudomembrane, the process continuing a fortnight. The staphylococcus and the pyogenes aureus were the only microbes found.

Clinical reviews of the subject are given by Long, of Randleman, N. C., ¹⁰⁴_{Dec. 3, '92} and Hope, of New York. ⁷¹_{Dec. '92} The latter author highly recommends papayotin as a solvent in these cases, a 5-grain (0.32 gramme) solution of the drug (peptonizing 200 parts of blood-fibrin), made up with a $\frac{1}{2}$ drachm (2 grammes) each of glycerin and distilled water, being repeatedly instilled into the nostrils by saturating a layer of absorbent cotton introduced between the affected surfaces. Fresh solution may thus be kept in constant contact with the exudation.

Chronic Rhinitis.—Raugé ²⁸⁶_{July, Aug.} objects to the term "chronic coryza," commonly applied to several nasal disorders, and suggests the propriety of withdrawing from this denomination the condition

improperly designated as hypertrophic rhinitis and that styled ozæna, and to limit the term "chronic coryza" to chronic catarrhal conditions, including those particular to scrofulous children and characterized by abundant secretion and uniform tumefaction of the mucous membrane. The author doubtless limits his remarks to French nomenclature. As far as the non-existence of an inflammatory process—not even a latent one—in true hypertrophic rhinitis is concerned, the question is still *sub judice*. Ozæna (*oζη*, a stench) is no longer used by competent men in English-speaking countries.

Tissier, of Paris,³⁷ July considers the anatomical relations between the processes of the same class in a clearer manner. He classifies (1) under "simple chronic rhinitis" a condition characterized by dilatation of the vessels, infiltration of the connective tissue with relatively abundant embryonic cells, and partial degeneration of glandular elements; and (2) under "chronic hyperplastic rhinitis" considerable dilatation of the vessels, vascular budding and development of connective tissue, the broad net-work of which is distended with mucin and infiltrated with migrating cells originating from newly-formed vascular elements by diapedesis, and presenting but slight, if any, glandular alterations. He terms "simple chronic atrophic rhinitis" a condition in which the tendency is toward sclerosis instead of the formation of new elements. The mucous membrane is transformed into a stratum of fibrous tissue, the scarce vessels of which suffer from peri- and endoarteritis, and in which epithelial metaplasia and glandular degeneration play a prominent part.

Polyak⁴, No. 1 describes a form of professional rhinitis, an example of which he was not able to find in the literature of the subject. It is characterized by swelling of the mucosa and ulceration. In one case there was perforation of the septum, presenting the appearance of that observed in workers in bronze. An able review of the general subject of nasal catarrh was given by Beverly Robinson.¹⁰¹³ June 21 Series, v. 4

Chronic Rhinitis in Children.—Bosworth's statement in his last excellent work, that purulent catarrh of children is purely local in character, and depends on no constitutional taint, is not corroborated, as far as the general application is concerned, in a paper by Ball, of London,²² June 21 dealing with 50 consecutive cases

of this trouble in subjects under 15 years of age. Twenty-seven were cases of chronic purulent rhinitis, and of these 23 were affected with adenoid vegetations, which he considers as a great predisposing cause. There were 9 cases of inherited syphilis, 8 of simple rhinitis, 4 of foreign bodies or rhinoliths, and 2 cases of empyema of the antrum. Cline, of Indianapolis,⁶¹ _{Oct. 22, '92} also writes an interesting article upon the subject, in which the importance of early treatment is insisted upon.

Hypertrophic Rhinitis.—Wingrave, ¹¹ _{Apr.} in an investigation concerning the morbid anatomy of hypertrophic and atrophic nasal disorders, suggests the term "turbinal varix" for the former, in view of the part played by the cavernous sinuses in the pathology. He subdivides the general subject into four classes,—vascular or cavernous, mucoid, lymphoid, and glandular,—according to the varying forms of histological change as regards elements involved, the series being arranged in the order of occurrence, the cavernous form, for instance, being the variety most commonly met with. In 20 cases of cavernous hypertrophy he found the following conditions eighteen times: The muscular walls of the venous canals were in an advanced state of mucoid atrophy. In places the muscular fibres were replaced by mere fibrous tissue, whilst in others the general mucoid changes had involved the entire thickness of the walls, and seemed to invade the interior without any previous fibrosis, so leading either to a complete destruction of the sinus or to an extensive distension. These changes were continued into the bone-spaces.

F. Oppenheimer ⁴ _{Oct. 8, '92} observed the return of normal menstruation in five chlorotic women, shortly after appropriate operative procedures having for their object the reduction of nasal hypertrophies, which greatly narrowed the upper respiratory tract. The author concludes that the cure was due to the increased amount of air inhaled, which, by favoring oxygenation of the blood, caused the chlorosis to disappear. This, in turn, being the main etiological factors of the amenorrhoea present, the normal functions were soon restored. He invokes, in support of his opinion, the improvement observed in children from whom adenoid vegetations have been removed, and the early disappearance of the pallor so frequently accompanying the presence of these neoplasms.

Bernstein ⁷⁶⁰ _{July 22} studied the influence of hypertrophic rhinitis as

a cause of asthenopia, and draws attention to the fact that correction of the refraction does not always remove the headache and other collateral symptoms met with in those cases. Careful examination of the nasal cavities usually reveals the source of the trouble. In three cases of marked asthenopia he found the middle turbinated bodies firmly impacted between the nasal wall and the septum, and extremely sensitive, the contact of a probe causing the pain experienced after prolonged use of the eyes. Reduction of the engorged mucous membrane completely relieved the symptoms.

Onadi, of Budapest,^{186 Oct. 15} reports a case in which the only interesting feature was the ability on the part of the patient to curve his tongue upward and introduce it behind the soft palate to the seat of the nasal stenosis, which was located at the posterior choanae. A case of this kind was already reported some years ago.

G. V. Woolen, of Indianapolis,^{61 Oct. 22, '92} calls attention to the importance of hypertrophy of the anterior of the middle turbinated body as a causative agent in hemicrania, mental hebetude, amnesia, etc., and ascribes to the nasal branch of the fifth the position of transmitter of pathogenic influence. The pressure exerted upon this nerve by the hypertrophied area sufficed, according to him, to occasion the nervous manifestations, owing to the intimate association of the vascular and nervous supply. He has observed 50 per cent. of recoveries to follow appropriate treatment, when this pathological cycle was found to exist, and when sufficient pressure existed, for the hypertrophies may exist and occasion no reflex untoward symptom, if sufficient room between the growth and the nasal walls be present. The method of removal advocated is that by the snare, cauterizations in this region presenting elements of danger.

E. J. Brown, of Minneapolis,^{105 Aug. 1} substitutes for cauterizations by means of acid or galvano-cautery, two longitudinal and parallel incisions with a thin saw along the entire length of the affected turbinated body and down to the bone, the parts having first been cocaineized. A small pledget of cotton soaked in a strong solution of aluminum aceto-tartras is then placed over the cut surfaces to prevent secondary haemorrhage. He states that the operation is painless, and satisfactory results are obtained with much more certainty and more rapidly than with the methods generally

employed. Farnham, of Milwaukee,¹ alludes to the diminished calibre of the cavities brought about by non-development of the alæ nasi. After adequately treating any intra-nasal condition that may complicate the case, he incises the cartilages of the ala or alæ, compromising the external orifices, and maintains them patent until healed by wires held *in situ* by passing over the ears, and worn day and night for a number of weeks.

Castex¹⁴ May 24 reports a case of facial erythema due to cocaine, in a woman suffering from hypertrophic rhinitis following influenza. He had touched the turbinated bone with a 20-per-cent. solution of cocaine. During the night she felt some discomfort, and the following day a redness was seen to extend over the cheek, simulating erysipelas. It disappeared in forty-eight hours.

Grayson, of Philadelphia,¹¹² June enters a protest against too free a use of galvano-cautery, and especially against the uncalled-for destruction of tissue often resorted to. The operator should endeavor to be scrupulously accurate in the limitation of his operation. Dessar, of New York,⁵⁹ Apr. 8 recommends the nasal bougie to prevent adhesion of surfaces after cauterization and to reduce other stenoses of the cavities, and describes such an instrument, made of vulcanized rubber. Bouffe, of Paris,³⁷ July recommends bougies in the treatment of nasal stenoses. It replaces, in his hands, cauterizations, scraping, and section of turbinals. Time will change his opinion of their worth.

Atrophic Rhinitis.—The generally-accepted theory that atrophic rhinitis is a sequel to the hypertrophic form continues to be the main point discussed in papers upon that disease. Nikitine²⁸⁶ Jan., Feb. is of the opinion that sufferers from this disease present a congenital anomaly of the nasal mucous membrane, facilitating fermentation of the secretions, the mucosa, however, having undergone an hypertrophic stage prior to the atrophic. McClure²²⁴ Sept. 24, 1921 considers it as the ultimate and logical result of neglected hypertrophy, the affection occurring as a primary disease. The main cause is lack of nutrition due to curtailing of the blood-supply,—*i.e.*, anaemia superinduced by hyperæmia,—the atrophic process being accompanied by desquamative inflammation. Couëtoux³⁷ May witnessed the transition from one form to the other stage in two of his brothers. To these views may be aptly applied the remarks made by Casselberry,¹⁰⁷⁷ Sept. 12 who considers them as failing to afford an adequate

explanation of the many cases of atrophic rhinitis which occur in early life. He has observed distinct hypertrophy to pass definitely and completely into the atrophic state, but only in cases affected with grave constitutional disease, notably tuberculosis and syphilis. He rightly views with favor the connection suggested by Bosworth between the affection in question and the suppurative rhinitis of children. Although, in my opinion, this theory presents elements of weakness, it furnishes an excellent clue for fruitful research.

The bacteriology of the subject also remains *sub judice*. Abel⁵⁰ B.13.H.5.6 has found, in sixteen cases of ozæna, a bacillus which is present, with many other organisms, in the muco-pus lying beneath the scabs which cover the nasal mucous membrane. In the secretion of other nasal diseases the author has not found this organism. The rods are short, plump, sometimes inclosed in a well-marked capsule, and often arranged in twos or in chains. They resemble Friedländer's pneumo-bacilli, but are distinguishable with certainty. The bacillus grows upon all the ordinary media under aërobic conditions, with production of a peculiar odor, like that of fermenting malt. The duration of life in the dry state is considerable. It stains with all ordinary aniline dyes, but not by Gram's method. It is pathogenic for various kinds of mice, and produces localized inflammation in rats and guinea-pigs. In Abel's opinion, it may be considered as the cause of ozæna. Probably the specific organism has nothing directly to do with the production of the well-known fœtor; the odor given off by cultures justifies the supposition. When the ozæna bacillus is absent, as in simple chronic inflammation of the nasal mucous membrane, the specific secretion is not furnished; hence there is no decomposition, and, consequently, no fœtor. Laurent³⁷ Oct. has always found the bacillus described by Abel, but, in addition, he observed a long and thin bacillus heretofore undescribed. Strazzi⁵⁰⁹ Jan. also brings forth a capsulated bacillus observed in no other form of rhinitis. Evidently, as Laurent states, we do not yet possess the least plausible evidence that specificity of the affection is due more to one microbe than to another. If, in addition to this, we take into consideration the fact that by no means all microbes vegetate in culture media, we can readily appreciate how far we are from a definite solution of the problem.

Knott²² Apr. 12 reports four cases of subjective ozæna, one of which

suffered also from mental aberration; this induced the fetid odor which he constantly perceived, although not noticeable to others. The latter was cured by hypnotism. In two of the cases the condition was associated with a gouty diathesis, and soon yielded to treatment based upon this diagnosis. The third case was cured by sedatives and the continuous current. No organic disease was connected with any of the cases. Sewill²² _{Apr. 19} suggests that empyema of the antrum might have been a factor of some importance in the cases reported. Küttnner,¹¹⁶ _{Mar.} invariably, in cases of atrophic rhinitis, searches for empyema or caries. By far the greater number demonstrate the presence of the classical affection without determinable cause.

H. M. Wilson, of Denver, ¹ _{Nov. 12, '92} criticises Bosworth's views regarding the cause of atrophic rhinitis,—*i.e.*, the mechanical pressure exerted by a closely-adhering film, in turn the result of a desquamative inflammation of the membrane. He cites cases in his own practice, and that of Wagner, to support his opinion that the affection follows a low form of inflammation of the turbinate bodies, which eventually results in their atrophy; that the latter stages of the disease give every evidence of having been preceded by hypertrophy; that the subjects of this disease present themselves for treatment of the throat, either entirely ignoring the nose or referring to it merely in an incidental way; and, finally, that this variety of atrophic rhinitis, by its simpler process, offers the logical explanation of the more complicated form.

Nothing very new has been presented in the therapeusis of the affection. Nikitine²⁸⁶ _{Jan.} prefers irrigation, antiseptic alkaline solutions, and insufflations of powdered nitrate of silver or boracic acid. Mour⁶⁷ recommends nitrate of silver and chloride of zinc applied with the atomizer every day or every other day. The nitrate of silver is used in the proportion of 10 to 25 per cent., the chloride of zinc from 2 to 10 per cent. Garnault²⁴ _{Feb. 12} angrily takes him to task for the nitrate-of-silver part, ascribing to Meyzes, of Amsterdam, ³⁸⁵ _{June, '90} the priority of gradually-increased strength in the solutions applied. This will cause many American specialists to smile, especially those who have been using the method these last two decades. To recommend a form of treatment by no means implies that it is a novelty. Kuttner¹¹¹ _{Mar.} extols inhalations of medicated steam, bicarbonate of sodium being considered as the best

solvent. He employs an instrument based on the principle of the steam atomizer, but furnished with a glass cylinder accurately fitting over the nose and upper lip, thus enabling the patient to advantageously inhale the medicated vapor.

Jouslain, ^{June 25}²⁴, believing that a saprogenous microbe in the glands and epithelial cells of the mucosa plays the all-important rôle in the production of the affection, was led to try strong microbicides in their nascent state, and found interstitial electrolysis with the production of oxychloride of copper to obtain the most satisfactory results. He employed the constant current, both electrodes being made of copper and twelve centimetres long by six millimetres thick. After cleansing the mucous surfaces, he introduced the cylinders, and allowed a current of 5 milliampères to pass through the membrane from electrode to electrode during five minutes. He then gradually reduced the current to zero, and changed the position of the cylinders after carefully cleansing them. This method, studied in connection with that introduced by Shurly and Delavan ^{p.146, 87}²¹⁶⁴ some years ago, is, without doubt, the most promising yet suggested in the treatment of the stubborn disorder in question.

Robertson, of Newcastle-on-Tyne, ^{Apr. 29}⁶ again asserts (see ANNUAL for 1893, vol. iv, page D-13) that stenosis of the ostium maxillare soon becomes involved in the pathological process, extending to the antrum proper, and ultimately leading to the necessity of draining and treating the latter. The opening and draining at once abolishes crust-formation, hence, in his opinion, placing this mode of treatment far above routine procedures. He insists upon the importance of making a large opening, and freely curettes the cavity to remove diseased mucosa, after which he introduces a soft-rubber drainage-tube, cutting it off flush with the gum. This is kept in for fourteen days, when an S-shaped spigot is fitted to the aperture, or the drainage-tube is continued. He reports several cases forcibly illustrating the advantages of the means advocated in his article.

Vibratory massage—rapid friction of the membrane with a cotton-covered probe—has been the subject of considerable discussion. The method introduced by Braun was tried by Chiari, ^{Dec. 11, '92}¹¹³ but this author failed to appreciate its benefits, and therefore prefers the usual forms of treatment, meeting, of course, with the recriminations of the sponsors of the system. Garnault, ^{Sept. 7, '92}³

however, studied the system with considerable care, and combined the use of electricity with it, especially the interrupted current. His results confirmed those of Braun. The value of ozone in catarrhal diseases of the upper air-tract, or especially in atrophic rhinitis, was alluded to by Rice, of New York,^{1 Aug. 19} who, however, refrained from speaking more decidedly of its merits, with the expectation of doing so when further experience in its use shall have been obtained.

Syphilitic Rhinitis.—The importance of carefully and frequently inspecting the nasal cavities of syphilites, insisted upon by Palmer,^{224 Sept. 9} finds corroborative evidence in a paper by Tissier,^{37 Feb.} who examined the nasal fossæ in 25 women presenting secondary cutaneous or mucous lesions. In 17 of these he found the membrane markedly involved, 7 cases presenting erythematous rhinitis and 8 syphilitic erosions. Two presented adhesion between septum and turbinals. Secondary lesions of the anterior portion of the cavities are inclined to be moist and papular, while erosions usually occur on the septum, presenting clear-cut, round, or oval edges.

In the nasal syphilis of children Dieulafoy^{185 July} objects to the administration of iodide of potassium. He administers 15 drops of Van Swieten's solution in a small glass of milk two or three times in the twenty-four hours, each dose thus representing 0.001 grammes ($\frac{1}{64}$ grain). Under the influence of this treatment the child is quickly benefited. If, however, this treatment is not well supported, and diarrhœa ensues, he recommends baths containing 1 grammme (15 grains) of the bichloride of mercury in 50 grammes (1½ ounces) of alcohol. If the syphilitic manifestations involve the skin, the strength of the solution should be reduced by one-half.

Tuberculous Rhinitis and Lupus.—I. Dionisio^{624 Dec., 192} reports two cases of primary nasal tuberculosis,—the one, a growth, which he removed from the septum nasi, the nature of which was demonstrated by microscopical examination (clinically, it was very difficult to recognize its character); and the second, which was of the ulcerative variety, with tubercular granulations. The former recovered, being treated with lactic acid and iodoform; but recurrence took place, and the lesion became more diffused than before. (Report of Corr. Editor Massei, Naples.)

Heryng, of Warsaw,^{551 Nov. 83, 88, 42, 44} draws attention to the transporta-

tion of the tubercular contagium to the nasal mucous membrane by the handkerchief and fingers, and to the importance of bacteriological and microscopical examination of the secretion from the ulceration, having found tubercular bacilli in one-half of his cases. Rethi¹³,_{No. 19} reports a case of buccal tuberculosis in which the ulceration had penetrated the hard palate, exposing the nasal cavities and the antra of Highmore. Giant-cells and tubercular bacilli were found in scrapings. Thermo-cautery sufficiently improved the case to permit the use of an obturator, but pulmonary and further local complications finally brought about a fatal ending. An interesting case of tubercular granulomata, mainly involving the septum, is described by Onodi, of Budapest.¹³⁶_{Ost.} Chiari, of Vienna,¹¹⁵¹_{B.I.H.2} reports six cases of tubercular tumors of the nose. He considers these neoplasms as due to tubercular infection of small wounds of the septum, and advises radical extirpation. Beyond the relation of cases by Weinlechner,⁸_{Dec. 8, '92} D. W. Montgomery,¹⁰⁹_{Feb.} and W. R. H. Stewart,¹¹_{July} no papers on lupus of importance were presented during the year.

Rhinoscleroma.—Stepanow⁵³⁰_{No. 20} presented a comprehensive paper on this subject, in which he gives the results of a systematic post-mortem examination of the entire upper respiratory tract, from the nostrils down to the middle of the trachea. The parts for which the greatest predilection was evidenced by the disease were found to be the cartilaginous portions of the nose proper, and the osseous portions of the entrance of the nasal cavities, the choanæ, and the larynx below the rima glottidis,—*i.e.*, all points where the parts were narrow in the normal state, and at the spots where pavement epithelium was changed into ciliated epithelium. Each region was affected in an isolated manner, and no spreading of the pathological process by continuation of tissue could be observed.

Epistaxis.—While Radcliffe, of Washington,⁷⁶⁰_{Oct. 15, '92} insists upon association of nose-bleed with the general systemic disorders, and recognizes that it may at times be a salutary process, Roth, of Vienna,¹¹³_{No. 23, '24} gives a succinct etiological classification of these disorders, plus the local lesions that render the flow possible. The general diseases are classified as follows: 1. Diseases of the vascular system,—scurvy, Werhoff's disease, haemophilia. 2. Fragility of the capillaries occurring as a result of infectious diseases

(typhoid fever, diphtheria, etc.) and subacute or chronic affections (malaria, pyohæmia, etc.). 3. Arterial or venous stasis (valvular cardiac affections, lung disorders, mediastinal tumors, cirrhosis, Bright's disease, amyloid degeneration of the liver, pregnancy). 4. Vicarious menstruation. The local lesions are the following: 1. Superficial erosions or ulcerations of membrane, usually situated at the interior portion of the septum. 2. Varicose dilatation of the veins of the mucous membrane. 3. Perforating non-syphilitic ulcer of the septum. 4. Syphilitic, lupoid, or tuberculous ulcerations. 5. Malignant neoplasms (sarcoma or cancer), benign neoplasms (polypi) rarely. 6. Fragility of the membrane without apparent lesion. 7. Traumatism.

Malbec¹⁴ Mar.s reported a case of epistaxis in which, before tamponing being employed, the flow of blood continued from the lachrymal puncta. This demonstrated, in the author's opinion, the inefficiency of the valves that have been described as existing in the lachrymal canal. In two cases of quotidian malarial fever complicated with epistaxis complete cessation of the latter was obtained by means of counter-irritation over the spleen. West,¹⁰⁶⁹ Jun.s Haffter,²⁶ June₁ and Guéniot⁶ Aug.₁₉ consider antipyrin as a very valuable agent to arrest nose-bleed. West places a pledget of cotton dipped in antipyrin solution or powder into the nostril. Haffter employs it in the same manner, while Guéniot contents himself with a 1-to-5 or even 1-to-10 solution. He directs the patient to pour a little of the solution into the hollow of the hand, and to inhale it vigorously. In children he uses a syringe and keeps the nose closed for a moment so as to allow the drug sufficient time to act. Spender, of Bath,¹¹ May greatly extols the merits of Spencer Watson's rubber bag inflated after its introduction into the nostril, especially with the instrument now manufactured, which resembles, when filled with air, an inflated sausage.

The artery already alluded to, and found near the anterior portion of the septum ascending vertically to divide finally into several branches which radiate toward the pharynx, is made the subject of three papers. Houdeville Martin³⁵ Jan.; Feb.²¹² and Duhamel¹²² Apr. locate over its course the great majority of spontaneous epistaxes. The introduction of a pledget of cotton saturated with a 5-per-cent. solution of cocaine causes the bleeding to stop sufficiently long to enable the operator to find a punctiform erosion from which the

blood oozes. Nitrate of silver fused at the end of a probe best serves the purpose to arrest the bleeding, the cavity being afterward protected by means of a pledget of cotton dipped in vaselin. Compression of the artery over the maxillary bone just beneath the ala of the affected side was resorted to by Coffmann, of Pueblo, Col.,⁸² Dec. 17, 192 but upon removing his finger the haemorrhage, after being arrested for an hour, returned. A small piece of wood was shaped to the location with a projection calculated to compress the artery, and, being sewn into a bandage, was held in place by an elastic band. This controlled the epistaxis completely.

Foreign Bodies and Rhinoliths.—Among the numerous papers on this subject—an array of repetitions—the case of Hanford² July 15 merits notice on account of the length of time that the foreign body—a stone the size of a filbert—had been in the nose. The pebble had been introduced when the patient was 4 years of age,—twenty-seven years before it was discovered. It had caused trouble only during the last two and a half years before its removal. In a case reported by Bollinger³⁴ Nov. 8, 192 a foreign body in the nasal cavity was found to be the cause of asthma, which disappeared as soon as the cause of reflex irritation was removed.

Myiasis.—F. J. P. Salts, of Lucknow, India,⁶¹⁷ June 1 relates a case of myiasis narium in connection with which he conducted a series of experiments. As a result of these, he concludes: 1. "That maggots cannot beget maggots. 2. Maggots obtained from decomposing flesh are not capable of changing their state, and live an indefinite period if left in putrid material. 3. Maggots found in decomposing or putrid meat are very different from those obtained from ovaries of insects. The larvae in the case described were those of the *Musca vomitoria*."

In Texas, according to J. P. Kimball, of Fort Clark,¹ Mar. 11 the offending fly is usually the *Sarcophaga gageorgina* (Wiedemann), an ovo-viviparous insect, the larvae of which are hatched within the oviduct. To ascertain the time occupied in their development the larvae were expressed from a fly upon a piece of tainted meat in a wide-mouthed bottle, and placed in the sun. In twelve hours it was estimated that the mass had increased in bulk fortyfold.

In a case reported by the author the injection of chloroform and water in equal parts was found insufficient, and 2 drachms (8 grammes) of pure chloroform were used, the pain produced by the

injection being allayed by injecting carbolized oil, and the nostrils washed out by means of a post-pharyngeal syringe with a 10-volume solution of peroxide of hydrogen. This was repeated once a day for three days, and obtained a cure. The solution of peroxide of hydrogen was continued at intervals of from five to six hours for several days, having proven very grateful to the patient as a disinfectant. About three hundred maggots had been ejected. In a letter referring to the above, Cerna, of Galveston, ^{Apr. 1} stated that he had seen four cases of the same nature. The only satisfactory treatment was calomel by insufflation. All the patients recovered. In one case three hundred and eighty-eight maggots were counted. The writer had had no experience in chloroform. He does not agree with Kimball that the fly deposits its larvæ only on unsound membrane, three of his patients having been entirely free from local or constitutional taint. A writer under the initials U. S. A. ¹ claims that administration by the mouth of quinine in 5-grain (0.32 gramme) doses every second hour, until 30 grains (1 gramme) had been taken, was a routine treatment with him when on a service tour in Texas. He claims to have had good results.

Mucous Polypi.—Allen, of Cincinnati, ⁵³ _{Jan. 7} criticises the view that these growths are myxomatous in structure. Instead of being a tumor composed of embryonal connective tissue, it is the pathological reproduction of a tissue which occurs physiologically in the embryo, and consists of a fine net-work of anastomosing stellate cells, the meshes thus formed being filled in with a homogeneous ground-substance rich in mucin. The solution extracted from a nasal polypus is, however, sero-albuminous. He ascribes this form of growth to inflammatory action. The vast majority are attached to some portion of the ethmoid, either to the free edge of the middle turbinated or higher up in the olfactory fissure. They occur in the course of a chronic inflammation of these parts, either of a diffuse or of a local character. As a result of this inflammatory process the thin muco-periosteal lining of these parts becomes loosened, and the submucous tissue-meshes become infiltrated with cells and fluid. If the acting cause be of a diffuse nature, the loosening of the tissues will be diffuse; if local, then the loosening of the tissues will be localized. The result of the accompanying swelling of the mucous covering of the middle and lower turbinals will cause partial nasal obstruction. This in turn causes diminished

intra-nasal pressure, with the result that increased swelling of the tissues takes place. Leucocytes and fluid are exuded in abundance. When the inflammatory growth has reached some size, the action of gravity comes into play and a pedicle is formed. Regarding the recurrence of polypi after removal, the author considers that if the pedicle be properly amputated no recurrence takes place. The softened mucous membrane is, however, predisposed to the formation of new growths, and what occurs is that after the removal of one polypus a chance is given for others to develop. Hence the necessity of treating the whole tract of diseased nasal mucous membrane. Zarniko ⁴ _{Oct. 10, Nov. 21, '92} alludes to the level of the left sphenopalatine foramen as the location of polypi in a case observed by him. Zuckerkandl has furnished proof that polypi were occasionally located on the septum, notwithstanding the statements to the contrary to be found in surgical works. To the cases already reported Lange, of Copenhagen, ¹¹³ _{No. 52, '92} adds six, and Natier, of Paris, ⁶² _{May} one. Robertson ¹³⁶ _{Nov. 15, '92} states that in the case of recurrent nasal polypi the mucous membrane of the antrum becomes involved in the course of the affection, reacting upon the intra-nasal condition, especially in the neighborhood of the antral aperture. Beausoleil ²⁵ _{Feb.} reports a case in which a bony cyst of the middle turbinate was found to contain a mucous polypus. The numerous advantages of electrolysis over other methods for the removal of these growths are depicted by Verdos. ⁹³¹ _{Feb.} This author uses 15 to 20 milliampères, the current flowing five to six minutes at each sitting.

Malignant Tumors.—A comprehensive review of the subject of malignant growths of the septum was published by Gouguenheim and Hélary, of Paris, ³⁷ _{Apr.} thirteen cases of sarcoma and eleven of epithelioma and carcinoma being mentioned, two of which (sarcomata) were taken from Gouguenheim's practice. To the two cases of telangiectasic sarcoma related by the authors above mentioned Dansac ³⁷ _{June} adds a third. V. Cozzolino ¹¹⁰⁵ _{Apr. 7} reports a case of sarcoma of the bony portion of the septum, on the right side, composed of polymorphous cells, which simulated melanosarcoma. It extended to and involved the nasal floor. (Report of Corr. Editor Massei, Naples.) D'Aguanno, of Palermo, ³⁷ _{Sept.} describes a case in a girl 11 years old, the sarcoma being located over the cartilaginous portion of the septum. Natier, of Paris, ³⁷ reported one case

of his own and five for Duplay, the ages varying from 24 to 56 years. Five of the six patients were women, the growth being located on the right nostril in all but one case. W. Milligan ¹¹ _{Jan.} publishes an interesting case (also in a woman) of sarcoma, presenting strong evidence of being the result of malignant degeneration of a nasal polypus. A case is also reported by Manteuffel. ²¹ _{July 29} Natier, in the above-mentioned paper, ascribes the almost universally fatal results characterizing these cases to the lateness of the surgical procedures.

A case of fibrosarcoma is described by Gevaert, ¹⁸⁶ _{July 15} in which the growth completely obstructed the nasal cavities and extended into the pharynx. Although removal of the upper maxillary was performed in order to thoroughly extirpate the neoplasm, recurrence occurred. The same procedure was carried out in a case of osteosarcoma treated by Duplay. ⁶⁸⁰ _{July 10} But one month had elapsed when the paper was reported.

J. Jackson Clarke, of London, ² _{Dec. 24, 192} regards the histological appearances of epithelioma as due to psorospermia, psorosperms, in his opinion, being the cause of cancer. He had traced, he stated, all the developmental changes in the life-history of the parasite, except the encysted condition so common in the rabbit's liver. In sections hardened with Muller's fluid, large cells, staining deeply throughout with carmine, and but slightly with acid haematoxylin, were abundant, for example, in some of the cysts of the kidney and ureter, and in the cell-nests and other parts of the epithelioma. In the latter, however, the oval form of the large cells was sometimes greatly altered by pressure. These cells, which had hitherto been regarded in epithelioma as degenerated cells, were, he thought, unmistakably psorosperms. Cases of epithelioma were reported by Dreyfus, ¹¹³ _{No. 36, '92} Du Castel, ⁸⁶⁵ _{June} Labit, of Bordeaux, ⁷⁰ _{Oct. 17} and Goris, ¹¹ _{Dec.} the papers, however, containing nothing new.

Angioma.—Schwager, of Wurzburg, ¹¹⁵¹ _{B.I.H.1} reports six cases, all of which were located over the middle turbinated body.

Papilloma—Cases of typical papillomata were reported by Scanes Spicer, of Landon ¹¹ _{July}; Sandford, ¹¹ _{Apr.} and J. Dunn, of Richmond, Va. ¹ _{Apr. 8} In the latter case the tumor was located on the left side of the cartilaginous septum near the floor, and was about as large as a common white bean. It caused pruritus and occa-

sional epistaxis. Removal was suggested, but declined. Two years after the patient was again seen, and stated that the growth had fallen off three months before. The author thinks that the spontaneous separation of the growth may explain in part why so few of these neoplasms come under observation.

SEPTUM.

Abscess; Perichondritis; Perforation.—The etiology of idiopathic septal perforation, as usually accepted, presents, in the opinion of Hajek, of Vienna,^{37 Oct., '92} several points of weakness. The pruritus giving rise to digital scratching and picking he considers as an indication that a local disorder exists, the picking becoming, on this account, a result of a primary cause, and losing the etiological position it occupies as such in the minds of most writers. A local catarrhal, though circumscribed, process causes the formation of a film, which, when scratched off, carries with it a stratum of epithelium. Repetition of the procedure gradually thins the protective mucous layer, exposes the perichondrium, and gives rise to the perforative process. The location of the perforation furnishes a clue to the correct cause. First coming in contact with the atmospheric current, on account of its exposed position near the nasal orifice, the spot receives the impact of all foreign material, dust, etc., that it may contain, this forming the primary cause of the local catarrhal process. The perforative action of metallic particles thus obtains a position in the scale of etiological factors quite in accord with the relative frequency of perforation observed in workers in metal. Cases are fully described by Suchannek, of Zurich^{214 Apr. 15}; Schröder, of Berlin^{4 Nov. 13}; Lublinski^{4 Nov. 13}; and Otto, of Dorpat^{21 Nov. 26, '92}; the latter observer furnishing, at the same time, an able review of the entire subject.

F. W. Cox, of Vermillion, S. D.,^{121 July} describes a case of abscess which seems to have been the result of influenza. The presence of polypi, however, invalidates, to a great degree, the value of the observation. The advisability of promptly opening a traumatic abscess to avoid perforation is well shown in cases described by Zaufal, of Prague,^{14 May 14} and Bermingham, of New York.^{202 Feb. 25}

For the correction of deformities of the nose resulting from abscess of the septum, Roe, of Rochester,^{1 Mar. 25} performs an operation which, judging from the illustrations published, quite meets

its purpose. There usually is, in these cases, a marked widening and thickening of the dorsum of the nose proportionate to the amount of flattening. This thickened ridge of tissue is incised through to the under side of the skin on both sides, a short distance from the septum, at a point where it thinned into the alæ of the nose. The skin is then raised from the dorsum of the nose, and the flaps turned upward and held in place by small ivory splints, having holes through which sutures are passed from one to the other through the flaps, and tied so as to hold them firmly in place without strangulating the parts. This relieves the flattened condition of the nose, and also gives the dorsum a sharpened appearance.

Deviation, Crests, and Spurs.—Potiquet, of Paris, ^{Aug. 27} has continued his study of septal deviations. While not refuting the influence that traumatism, polypi, etc., may have over the incurvation, he thinks that the latter is intimately associated with evolution. As supporting evidence, he adduces the conclusions reached after careful examination of a large number of skulls, to the effect that (1) the septum yields as age advances, attaining its maximum deviation at adult age; (2) the deviation in the white race is more frequently observed and more accentuated in man than in woman; (3) it is more marked in superior than in inferior races. The researches of Lissauer, furthermore, tend to show (1) that the superior maxillary bone united to the palatine executes, from birth to adult age, a movement of rotation around a common centre corresponding with the point of union of the postero-superior extremity of the vomer with the sphenoid; (2) in the white race this motion is more pronounced in man than in woman; (3) it is most marked in the superior races. The two series of propositions present sufficient analogy to furnish food for thought, the inference being that as the process of rotation progresses the septum is forcibly incurved, unless the circle described be parallel with a plane, leaving sufficient perpendicular space for the proper development of the septum. The part played by the subvomerian bones and Jacobson's organ were alluded to last year. Potiquet develops his ideas on the subject in a paper published later. ²⁸⁶ _{Nov., Dec., '92}

Gellé, of Paris, ^{Mar., July} ^{37 11} describes a case in which he had followed the evolution of the pathological process, which, originating in a

traumatism, terminated in a permanent malformation of the nasal septum. The blow was received directly upon the nose, fracturing the cartilage and tearing both covering membranes. The septum of the patient (a little girl of 5) was, before the accident, quite straight. An abscess appeared at the site of fracture, perforating the cartilage and involving both sides. The swellings were incised, washed, and dressed with iodoform gauze each morning. The symptoms were increased by an attack of "*la grippe*," which occurred two weeks after the accident. Fifteen days after its subsidence the nares presented the appearance, on the right side, of a radiated depression, and on the left side of a gray-white, consistent, and painless projection. The former became clearer and deeper, and the latter developed into a spur in contact with the inferior turbinated, solid and immovable, larger in front than behind.

In the way of treatment nothing new has been proposed. Dionisio, of Turin, ⁴⁶² _{Oct., '92} does not consider that the removal of the bony ridge with a saw gives sufficient room. He therefore proposes to remove a cuneiform piece of the deviated and thickened portion, thus substituting a lateral cavity for a projection. He does this by means of an instrument devised by him. Spilsbury ³⁹ _{July} extols Delstauche's method, which consists in crushing the septum by means of forceps armed with a stellate knife. Good general reviews of the subject are given by Scheppegrell, of New Orleans, ¹² _{June}, and Cheval. ¹³⁶ _{July 15} The latter author has used electrolysis considerably, and has never observed perforation of the septum as a complication. By completely penetrating with his needle the projecting ridge of the septum antero-posteriorly, he usually succeeds in making one sitting suffice. In the opinion of Meyer, of Berlin, ⁶⁹ _{No. 22, '92} electrolysis is better than galvano-cautery, because after-treatment is not necessary, and no reaction follows. It can be performed without pain by previous application of cocaine. Bipolar application is less disagreeable than monopolar, and of better effect. The duration of the treatment is longer than that of the galvano-cautery, because a second application can only be made when the eschar of the first has disappeared. Electrolysis is also recommended by Boland, of Verviers, ³¹⁸ _{Dec. 15, '92} and Schmidt, of Frankfort. ¹¹ _{June}. In the opinion of Newcomb, of New York, ⁵⁹ _{Aug. 6} the method deserves trial, but he thinks that the use of the trephine brings about the

same results far more quickly. Strazza⁶²⁴ has used the bipolar method as described by Moure in twenty-eight cases, and failed to get the satisfactory results claimed by that author. He believes, however, that it is valuable in the treatment of faint-hearted patients who fear more radical procedures. As the majority of patients are faint-hearted, this view in no way lowers the standard of the method, which seems to be gaining ground every year. Scheinmann, of Berlin,⁸⁷ May reports a case in which caries followed its use, probably the result of superfluous ampèrage.

Major, of Montreal,¹ April introduced a hooked knife for the removal of certain forms of septal crests or spurs, making it possible to cut the latter by enabling the operator to secure a satisfactory hold on the outgrowth at its posterior edge. A universal handle arranged with a lever and spring attachment can accommodate any number of knives, varying in size, shape, and curvature. Bayer, of Brussels,¹¹ Dec. has also introduced a knife, cutting from behind forward.

In the opinion of Delie, of Ypres,¹¹ Dec. the older gouges for the removal of spurs are too large. He describes a new instrument composed of a lamina of about one centimetre in size, the edges of which are guarded, projecting for some millimetres beyond the blade. An incision is first made in the mucous membrane, which is reflected, and the gouge is then applied and cuts easily. The edges of the gouge protect the neighboring parts. After removal of the spur, tampons are inserted to arrest haemorrhage.

Hay Fever.—Sajous,⁶⁷³ Sept.;¹¹ Oct. after studying hay fever (which he terms “hyperæsthetic rhinitis”) in a large number of cases, concludes that it is not a disease *per se* in its active form, but merely the result of a sudden cessation of the inhibitory functions of the nerve-centres presiding over the physiological processes of the upper respiratory tract. These nerve-centres, under the influence of hereditary or acquired disease of an adynamic type, having themselves become adynamic, are able to carry on their functions under ordinary circumstances; but when demand is imposed upon them for inordinate functional activity, they lose all power of control, and give rise to the symptoms observed after section of the sphenopalatine ganglion, or of the cervical sympathetic, as shown by Claude Bernard, most marked of which symptoms is hyperæsthesia.

Concurring with, and as a result of, this central adynamia there exists a liability of the nasal mucous membrane to become unduly influenced by certain irritants, physical or chemical, or a central susceptibility to the emanations of drugs, plants, animals, or other elements. When either of these irritants or emanations are subjected by their nature to the laws of periodicity, hyper-aesthetic rhinitis manifests itself periodically. If periodicity does not regulate the appearance of the causative elements, the disorder may present itself at any time of the year, whenever the susceptible individual is exposed to the element or elements to which he may be vulnerable.

Habit and psychical impressions, as is usually the case in neurotic disorders of an adynamic type, may play, in an especially sensitive individual, an active part in the production and cessation of the symptoms.

The author ascribes a prominent rôle to the ciliated columnar epithelium covering different parts of the respiratory tract in the production of a paroxysm, owing to its excito-motor physiological functions and the prehensile retentive powers of the ciliæ. An exception is made, however, in the case of the olfactory area, which is not covered with ciliated epithelium; but the intimate connections between the central sources of nervous supply of both respiratory and olfactory regions readily demonstrate how an emanation to which the sufferer may be inordinately sensitive may act as an exciting cause.

The central regions affected he believes to be mainly the gray substance of the bulb which represents the prolongation of the posterior horn, the transit involving the spheno-palatine ganglion, which, besides its motor and sensory roots, possesses a sympathetic root derived from the carotid plexus through the vidian. The presence of asthma as a complication indicates the involvement of a greater central field than that implicated when the nose alone is the seat of paroxysm. This explains the fact that asthma exists in a proportion of the cases only. While in some of these we may have the nasal and bronchial symptoms begin together through simultaneous invasion by irritants of the nose and lungs, especially if the patient is to any degree a mouth-breather, the lungs can become involved, as is well known, through nervous communication; that is to say, by reflex action.

Although not overlooking this reflex cause of asthma in some cases in which it occurs simultaneously with the nasal paroxysm, he does not consider it as entitled to the position accorded it by most authors. Were asthma thus induced in all cases, its presence would become manifest, as soon as tumefaction of the nasal membrane would give rise to pressure upon the sensitive reflex areas, in all cases in which the central adynamia would involve sufficient territory to also expose the bronchial tract. In the very great majority of cases in which asthma exists as a complication, on the contrary, it appears sooner or later *after* the onset of the nasal symptoms,—usually two or three weeks. The lungs in these cases, though exposed by the extent of the central disorder, are protected on account of their anatomical situation, and through the character of the surfaces over which the atmospheric current must pass before reaching them.

The open mouth, however, when the nose is too tightly occluded by the paroxysmal tumefaction to at all permit respiration through the normal channel, becomes the doorway of the irritant-laden atmosphere, and the asthmatic attacks begin sooner or later, according to the quantity of irritating particles permitted to reach the lungs. Many conditions may thus play an active part in the production of an attack, most important of which are the proportionate amount of irritating matter in the air inhaled; the number of respirations per minute; the number of special irritants to which the patient is physiologically sensitive; the anatomical conformation of the mouth, pharynx, and larynx; the humidity characterizing these parts in the case, etc.,—thus constituting as diverse a series of influencing circumstances as the periods of onset of the bronchial paroxysm are varied. As an evidence of marked value in favor of the protection afforded the lungs by the upper respiratory tract, he cites the increased severity of the asthmatic paroxysm sometimes observed after seasonable relief or cure of the nasal disorder.

As regards the widely-differing results obtained from local treatment or cauterization of the nasal mucous membrane, they are ascribed to the great variation existing in the systemic and local conditions capable of giving rise to the central adynamia.

Greville Macdonald, of London,¹⁵ considers cases in which no objective disease or malformation of the nasal fossæ exists as the

most unsatisfactory to treat, and, as a corollary of this, that the greater the amount of objective mischief the greater the likelihood of our being able to benefit the patient. A highly-favorable condition to find is some form or other of obstruction to the passage of the inspired air through the inferior meatus,—*i.e.*, ecchondroses and exostoses of the septum, whereby the current is compelled to ascend into the more sensitive middle meatus. Operative procedures for their removal should only be resorted to, however, when they are responsible for symptoms requiring relief. Hypertrophies of the inferior turbinated body, whether anterior, middle, or posterior, are about equal as far as their importance in prognosis is concerned, which to a great degree depends upon the thoroughness with which they have been removed. Septal hypertrophies, smooth and boggy swellings over the anterior and upper portions, opposite to and in front of the anterior extremity of the middle turbinated body, offer smaller opportunities for satisfactory results, although the acute hyperæsthesia characterizing them is markedly reduced by galvano-cautery or other destructive agents. Still less satisfactory are the vascular tumefactions of the inferior turbinated body, to be clearly differentiated from true hypertrophy. The author considers himself bound to admit that, by carefully selecting cases fit for operative procedures, the treatment of hay fever must be considered as highly satisfactory. Although but few cases are absolutely cured, the difference between being either a prisoner or an exile for six or eight weeks every year and having the symptoms reduced to no more than sneezing a few times while driving along a hot and dusty road is sufficiently striking to make most sufferers willing to undergo treatment which can do no harm and may do immense good.

In Sajous's experience ⁶⁷³ _{Sept.; Oct.} ¹¹ the proportion of permanent cures obtained have been greater, and the relief afforded in uncured cases more marked and lasting, under glacial acetic acid than under galvano-cautery applications. The vibratile movement of the cilia, as is well known, is stimulated by alkaline solutions and arrested by acid ones, while mucus, or its denser element, mucosine, formed by the process of desquamation, is coagulable by acetic acid, but not by heat. The marked affinity of glacial acetic acid for epithelial cells is therefore an established fact; so that it possesses every quality calculated to annul, for the time being, the

local physiological functions. By causing an organic alteration by coagulation of the entire epithelial layer it paralyzes or destroys the terminal filaments furnishing the parts with sensation, and, by disorganizing the cilia, annuls their power of retaining in their meshes the irritating elements which induce the paroxysm. Galvano-cautery produces the same superficial action, but does not affect the deeper portions of the epithelial layer unless pressure is exerted.

The epithelium of the mucous membranes is being destroyed and replaced throughout life, sometimes very rapidly, as in catarrhal affections. In its reproduction it is always derived from pre-existing epithelium by simple division of cells, the evolution taking place from depth to surface. When, however, the surface becomes in any way disorganized, and an ulcerative process occurs as a result, the reproduction takes place from the side, the new epithelium spreading from the edge of the ulcer.

He condemns the advice given by some authors to avoid local measures after the annual paroxysm has begun, and describes cases to demonstrate the value of cauterization of the nasal cavities, begun within the month preceding the attack or during the latter. In these cases the results were all the more valuable, in that they were treated before cocaine had been introduced, and owing to the fact that no objective disease or malformation of the nasal fossæ existed, the author believing with Greville Macdonald that the greater the amount of objective mischief the greater likelihood of a successful result. He asserts, in this connection, that had the treatment by cauterization of the nasal mucous membrane been considered by its supporters from the start as calculated solely to arrest the year's paroxysm it would have presented as great a proportion of successes as any method proposed in any other branch of surgery.

As regards palliative treatment Sajous advocates the following measure: The engorged tissues are contracted by means of a solution of cocaine, and the effect is maintained by means of a 10-percent. solution of menthol, in almond-oil, the author objecting to mineral oils on account of the sensation of heat they occasion after a few days' use. One application of the cocaine solution every other day by the physician, and ten or twelve applications of the menthol solution a day by the patient, usually suffice to keep him

comfortable without exposing him to the cocaine habit. Atropia internally, $\frac{1}{200}$ grain (0.00032 gramme) every four hours the first day, then every six hours, greatly increases the efficacy of the nasal treatment.

Ferber, of Hamburg, ⁴¹ Aug.¹⁴ who is himself a sufferer, has completely relieved himself and others of the trouble by the following procedure: As soon as the least sensation of fullness in the nose appears, there is recognized a certain amount of pallor in the ears. A thorough rubbing of the ears, at times even to contusion, has always succeeded in freeing the nasal mucous membrane from its congestion. The rubbing, however, must be *thorough* and repeated as often as the least symptom of congestion returns to the nose.

D. B. Kyle, of Philadelphia, ⁹ Dec.¹⁹, ¹¹ Nov., ⁹² Mar. recommends cleansing of the nasal mucous membrane by the alkaline solution, then applying an 8-per-cent. cocaine solution with a plegget, leaving it in contact ten minutes, and following with a spray of the same strength. The solution used was an aqueous solution of witch-hazel in which an alcoholic solution of cocaine of from 1 to 10 per cent. was suspended. In cases in which the drug was injected into the sensitive areas the results were more rapid. A case characterized by reflex asthmatic symptoms was markedly benefited by a spray of 8 per cent. of the solution. The treatment failed to benefit the cases in which there was marked hypertrophy, but partial relief was obtained after removing the thickened membrane.

J. N. Muenich, of Jefferson, Wis., ⁷⁸⁶ Nov., ⁹² obtained prompt relief with the following ointment applied to the Schneiderian membrane: Rx Cocaine muriate, 3 grains (0.2 gramme); thymol, 3 grains (0.2 gramme); bismuth subcarbonate, 2 grains (0.13 gramme); vaselin, 1 ounce (31 grammes).

Headache.—H. W. Loeb, of St. Louis, ⁶⁶³ Sept. considers the following conditions of the nose as being capable of causing headache. Acute inflammations of the nasal mucous membrane, chronic rhinitis, rhinoliths, and foreign bodies, septal deformities, deflections, spurs and ridges, diseases of the accessory sinuses, chronic atrophic rhinitis, and anything which caused the middle turbinated tissues to press against the septum. In headaches of the following kinds a nasal origin might be expected: 1. Frontal headaches. 2. Hemicrania starting about the orbit. 3. Long-continued head-

aches. 4. Headaches of which successive attacks were identical or similar. 5. Headaches increased or originated by acute rhinitis. 6. Headaches associated with evident disease of the nose or accessory cavities. Bresgen, of Frankfort, ³⁴ Jan. 31, ¹¹ Mar. states that a narrow nose, retracted especially about the middle turbinateds, predisposes to cephalgia. In recent coryza, headache is seen only when the swelling of the mucosa attains such a degree that there results pressure in the nose lasting for at least some hours. During the attack, if the mucosa, where swelling predominates, is touched with a probe, extreme sensitiveness is observed. In cases of suppuration cephalgia is generally dependent upon the retention of pus, especially in the region of the middle turbinateds. In the headaches associated with hypertrophy of the pharyngeal tonsil or naso-pharyngeal suppuration the author asks if the headache is not due to concomitant affection of the pituitary membrane. From the localization of the pain it cannot be said for certain what region of the nasal fossæ is the seat of the compression. Nervous irritability in the patient in certain cases favors the occurrence of nasal headache. Heymann, of Berlin, ⁴¹ Mar. 30 deems the concurrence of persistent headache and a nasal affection as an indication of inter-relationship demanding treatment of the nasal lesions. Many sufferers otherwise unassisted are thus cured. Scheinman ⁴ No. 49 concurs with these views in an exhaustive article.

Epilepsy.—F. Kjellman ³⁷⁰ V. 55, No. 2; ⁶⁷³ June reports two interesting cases. The first was that of a school-boy, 12 years of age, who had had spasms for two years, with inability to close the jaws, sometimes associated with momentary unconsciousness, which gradually increased in severity. There was found, upon nasal examination, a spongy hypertrophy of the mucous membrane of the two inferior turbinated bones. The turbinateds were cauterized, but a return of the trouble occurred after repeated cold baths during the cold weather. Cauterization of the turbinated bones again caused the disappearance of the untoward symptoms, and the boy remained perfectly well. In this case there was a morbid dilatation of the cavernous vascular plexus underlying the nasal mucosa, through which condition the terminal filaments of the trigeminal nerve was exposed to friction, which condition of irritation was transmitted to the motor centres of the cerebral cortex, and resulting in epilepsy, tonic cramp, and occasional loss of consciousness. The sec-

ond was that of a boy aged 6 years. In the slighter attacks he had spasmoid movements in the left hand and arm, and asthma; in the severer attacks epileptic symptoms appeared, with loss of consciousness and clonic spasms. At the examination Kjellman discovered a moderate diffuse swelling, soft to the touch of a probe, on the right inferior turbinated. Cauterization was not followed by any amelioration of the symptoms. The boy had, for three years past, been addicted to the bad habit of sleeping with his left thumb in his mouth, and closing, at the same time, the left nostril with the other fingers. Thus, nasal breathing was obstructed. This case seems, according to the author, to prove (1) that epileptiform attacks of nasal origin are not always due to an irritation of the nasal ramifications of the trigeminal nerve; (2) that certain cases of so-called *epilepsia nocturna* are initiated by an asthmatic attack, and are essentially dependent upon obstructed nasal respiration. (Report of Corr. Editor Eklund, Stockholm.)

Tetanus.—Arcangeli ⁵⁸⁹_{July 29, Oct. 21}² records the case of a lady who, in consequence of violent epistaxis, had her nostrils tamponed by a surgeon. The tampons were removed after a few days, but the patient complained of a feeling that some were still remaining, although this was not the case. This feeling continued, and a few days later genuine tetanus developed. A supply of Tizzoni's anti-toxic serum not being available, treatment by large doses of chloral was employed, and the case was in this way brought to a successful issue. It is interesting as the first recorded case of tetanus following a nasal lesion.

Ear.—Gradle, of Chicago, ⁶¹_{June 8} concludes that both acute and chronic purulent otitis are uninfluenced by nasal treatment, and that the liability to relapses after their cure is decidedly lessened by the removal of naso-pharyngeal disorders. Acute catarrh of the middle ear will generally terminate in complete recovery under aural treatment, and sometimes even without it, provided there are no persistent nasal or pharyngeal lesions. When these are present, however, the disease is much more likely to become chronic in spite of aural treatment, and in many instances can either not be cured or, if improved, will speedily relapse unless the normal state of the nose and throat is restored. Proliferating or adhesive disease of the middle ear is the consequence of retranasal catarrh, and its course is determined by the course of the disorder causing it.

Aural treatment alone is practically useless in this form of trouble, while nasal treatment, if successful as far as the catarrh is concerned, will also arrest the ear disease.

Eye.—Batut, of Toulouse,³⁷ Feb. describes two cases in which diphtheritic products were exhibited in the nose and eyes and a case of rhinitis with lachrymation and erysipelatous complications. He cites two cases in which the nose and eyes were affected, and a case of syphilis in which the disease was propagated from the nose to the eye, and adds, besides, an important list of typical cases to the literature of the subject. Ziem, of Dantzig,³⁷ Jan. records two cases of iritis in which cure was obtained by opening the maxillary sinus in the one case and by removing a septal spur obstructing the nasal cavity in the other. Valuable reviews of the general subject, all contributing evidence to confirm the importance of nasal affections in a not inconsiderable proportion of ocular disorders, are presented by Lieven, of Wurzburg⁶⁹ Dec. 1, '92; Grossmann, of Budapest²⁸³ Nos. 14, 15, 16, 17, 18, 20; and E. J. Bernstein, of Baltimore.⁹ July 22

Psychoses.—Pick, of Prague,⁸⁸ No. 16 reviews the mental disorders and aberrations occurring as complications of nasal disease by reflex action, and enumerates several cases in which complete cure followed treatment of the nasal cavities. J. G. Carpenter, of Stanford, Ky.,⁶¹ Nov. 6, '92 contributes a paper of the same kind.

Enuresis.—Otto, of Dorpat,²¹ p. 345 reports the case of a girl of 18 years who had been subjected to many forms of treatment for the cure of persistent enuresis nocturna. The presence of adenoid vegetations suggesting a connection between the two disorders, the growths were removed. A temporary arrest of the enuresis occurred, and the recurrence suggested the possibility of further nasal trouble. Investigation demonstrated the existence of senechiaæ between the septum and one of the turbinated bodies. Complete cure followed their cauterization.

ACCESSORY CAVITIES.

Antrum.—A number of authors have contributed papers in support of transillumination in the diagnosis of empyema. Even Garel, of Lyons,³⁷ who had at first attached but little importance to this procedure, now gives it the weight of his sanction. Ziem, of Dantzig,⁶⁸⁰ Jan. 10 however, in accord with Lichtwitz, of Bordeaux; Hartmann, of Berlin, and others, considers that it presents but

little diagnostic value, because the luminous rays projected into the sinus originate not only from their direct source, the mouth, but also, indirectly, through the nose. The cavity is thus illuminated from two directions, the superior or nasal rays causing it to appear translucent whether pus (in small quantity) be present or not. None of these writers, however, totally deny that the procedure is possessed of merit; they admit that in many cases it is possible, especially where the quantity of pus present is great, to establish a diagnosis of empyema, but they argue that it does not at all assist the practitioner in establishing a negative diagnosis. To the well-known diagnostic signs furnished by transillumination, Garel³⁷ _{Feb.; Mar.}¹¹ adds another, viz., absence of luminous perception on one side by the patient himself. With the lamp in the mouth of a healthy subject, whose eyes are closed, a luminous impression is produced upon the lower part of the retina. In four cases of unilateral empyema Garel observed that this luminous perception was suppressed on the side when the antrum contained pus. The subject was discussed at a meeting of the Berlin Laryngological Society.³⁷ _{May} Davidsohn contended that the sign was of no value, and that the presence of pus would not impede the passage of light, the injection of milk into the antrum by Herzfeld having demonstrated this point. The specific gravity of milk differs so markedly from that of pus, however, that the point is not well taken. While the former may allow luminous rays to pass, the latter may thoroughly intercept them.

Acute empyema of the antrum is not often met with, although involvement of the antrum in the inflammatory process of an acute coryza is not uncommon. An interesting case of acute empyema of nasal origin is reported by J. Wolfenstein, of Cleveland, O.¹ _{Aug. 5} No surgical procedures were resorted to, the treatment consisting in keeping the nasal cavity (into which much pus penetrated from the sinus) clean, and to facilitate the escape of pus by position,—lying on a lounge with the head toward the floor. The trouble gradually subsided, and had entirely disappeared in three weeks. The author, therefore, concludes that the antrum should not be subjected to surgical procedures in acute empyema until the simpler remedies have been given a fair trial. The subject is carefully studied in this paper, as well as in one by Schaeffer, of Bremen.⁶⁹ _{Nov. 24} In a case of acute empyema reported by Gellé,

of Paris, ¹⁶⁴ July 27, the trouble was caused by a tampon inserted to arrest a violent epistaxis, and which the patient would not permit to be extracted, fearing a recurrence of the bleeding. Removal of the tampon and antiseptic irrigation of the nasal cavity involved sufficed gradually to bring about recovery.

J. W. Downie, of Glasgow, ²¹³ Jan. reported a case of chronic empyema of the antrum in a girl of 6 years, in whom he found extensive necrosis of the upper maxilla. Within the cavity, at its upper anterior portion and imbedded in the wall, he found a permanent canine tooth, which he extracted. The crown of the tooth was large and fully developed, and the fang in an advanced state of development. Necrosis also complicated a case reported by Semon, of London. ¹¹ June,

Moure, of Bordeaux, ¹³⁶ Jan. 15 suggested a new method of penetrating the antrum through the middle meatus. He thinks that with the ordinary trocar fracture of the nasal walls can be produced, and therefore employs galvano-cautery to perforate the intercepting bone and mucosa. The opening once made, he introduces a small trocar through it and attaches to the latter the nozzle of a syringe. Moure protests against the tendency of certain specialists to open the antrum too readily; the diagnosis of the affection ought to be obtained from other signs, and exploratory puncture reserved for cases where the presence of pus is presumable. Opening of a sinus may serve to give entrance to microbes and lead to suppuration. He has observed cases in which, in spite of all antiseptic precautions, the irrigating fluid, at first pure, afterward contained muco-pus. Baumgarten, ¹¹ Aug. at a meeting of the Medical Society of Budapest, refers to a case successfully treated by "broad opening" and tamponing with iodoform gauze. An ingenious device is described by Major, of Montreal, ¹ Aug. 19, the purpose of which is to obtain a well-fitting drain for the antrum. The tooth being withdrawn and the bottom of the cavity drilled and cleared of secretions, a piece of soft pine-wood, suitably shaped, is introduced and left *in situ*, while a mold of the external orifice and surrounding surfaces is taken with plaster of Paris. Being allowed to set with the lower end of the wooden pin sticking in, a good mold of the whole is obtained, including the exact angle of the opening. This mold is used for the manufacture of a golden metallic drain.

The literature of the year contains several excellent reviews, one, indeed, the thesis of Repp, of Darmstadt,²¹⁶⁵ containing over four hundred references. Worthy of special mention are also those of Birkett, of Montreal²⁸² Mar.; Sewill, of London⁶ May 6; Heymann, of Berlin²⁰ No. 2, 192; Lermoyez³ Feb. 8; Moreau R. Brown, of Chicago⁵⁹ Apr. 1; Cartaz, of Paris¹³⁶ June 1; Kuchenbecker, of Berlin²⁰³⁸ 192; and Hajek, of Vienna.⁵⁷ Dec., 192

Syphilis of the antrum is sufficiently rare to cause Lewin, of Berlin,²⁸⁶ July, Aug. to believe a case reported by him to be the only one on record. The patient had previously been successfully treated for specific ulceration of the lower limbs. When he again presented himself for treatment the external signs of antral empyema coincided with syphilitic nasal ulcerations, the inferior turbinate having been destroyed. A case of the same kind had been reported by Combe, of Paris,³⁷ July a couple of weeks before. According to Luc, of Paris,²⁸⁶ July, Aug. a case had been described by himself,²⁸⁶ p. 217, 189 and another by Hermet.²⁴ Feb. 17, 189

A case of foreign body of the antrum is reported by Eulenstein, of Frankfort.³¹² V. 27, p. 141 While perforating the alveolus with a four-millimetre trocar the point of the instrument broke off and remained in the cavity of the sinus. Four months later it was ejected from the nose while the patient was washing out the antrum by means of a cannula introduced through the alveolar orifice. Boric-acid irrigations soon relieved the local trouble.

A case of malignant transformation of benign tumors of the antrum of Highmore is reported by Fink, of Hamburg.¹¹⁵¹ E. 2, H. 1; Feb., 1894 The patient, 33 years old, was affected since his youth with obstruction of the right half of the nose. In his twelfth year polypi were diagnosed and operated upon from time to time, but they always recurred, and, since 1879, a polypoid degeneration of the antrum of Highmore was suspected by Esmarch, and the opening of the sinus was proposed, but was not allowed by the patient. When the author first saw the patient, in 1889, a protrusion of the upper maxillary region was observed, and the nose was found to be filled with polypi. The polypi were removed, and during the next few years a great many polypi were also removed. In August, 1892, the patient had severe pains in the right upper jaw; at this time the nose was comparatively free. Extraction of a tooth was of little avail, and various antineurinalgic

drugs were applied without effect. It was now believed that there was an empyema of the antrum of Highmore. The sinus was opened, but only a little pus was removed, and the presence of masses of tumors in the sinus could be determined. Some time later the zygomatic bone appeared to be swollen. The upper jaw was now resected after Nelaton's method by Schede. The examination showed that there was a carcinoma. Some days later pains in the neck and swelling of the vertebrae of the neck occurred. Death followed from cachexia. In this case no doubt can exist that benign fibromyxomata are transformed into carcinomata. This is proved by the progress of the disease, and by the result of the microscopical examination. Cases of epithelioma of the antrum were published by Gaetano⁵³⁷ _{V.14} and Sabrazès,¹³⁶ _{Dec. '92} and cases of sarcoma by Wheaton,¹⁰⁵ _{Apr. 1} Herzfeld,¹³⁶ _{Mar. 1} and Hadra.¹³⁶ _{Mar. 1} Lublinski¹³⁶ _{Mar. 1} states that Fowler's solution has given considerable relief in these cases.

J. N. Mackenzie, of Baltimore, ⁷⁶⁴ _{Jan., Feb.} adds a second case to that of Zarinko, of Berlin, ⁶⁹ _{No. 44, '91} of aspergillus mycosis of the antrum. In Mackenzie's case shreds of false membrane were passed from the oral orifice of the cavity, some of which were as long as the index finger. This point is of unusual interest on account of the general belief that the antral mucous membrane is incapable of producing a false membrane. The author further points out that Zuckerkandl, who has most carefully studied the normal and pathological anatomy of the antrum, affirms that the anatomical structure of its mucous membrane renders the presence of diphtheritic or other membrane utterly impossible.

Frontal Sinus.—Luc, of Paris, ²⁸⁶ _{July, Aug.} publishes a case of empyema of the frontal sinus in which the only indication of the trouble was a slight discharge from the nose. No apparent cause could be found, and Luc, therefore, concludes that an absolutely latent form of frontal abscess may exist, possessing but the symptom described as a manifestation, and which can only be differentiated with difficulty from the suppuration originating in the ethmoidal or maxillary sinuses. Hartmann, of Berlin, ²²⁶ _{B.45, H.1} in an anatomical study, calls attention to the fact that anomalies of the frontal sinuses are frequent, and that catheterization can only be satisfactorily conducted in about 50 per cent. of the cases. In the latter, enlargement of the fronto-nasal canal and local

antiseptic washing will often obviate the necessity of an external opening.

A case of chronic empyema of traumatic origin is reported by Montaz, of Grenoble.²⁸⁶ July, Aug. The patient, an aged man, had been struck between the eyebrows by a stick of wood. Alternating fits of local pain and fetid discharge of the right nostril continued twenty-four years, when marked tumefaction of left supra-ciliary region presented itself, accompanied by loss of flesh, fever, night-sweats, etc.,—manifestations of a septicæmia. Montaz, called in at the last moment, opened the cavities and re-established the patency of the infundibulum. The septicæmia, however, could not be arrested, and the patient died eight days after. Valude, of Paris,¹⁵² Jan. 20 doubts the necessity of permanent drainage, provided that no coincident disease of the neighboring structures exist and that the wound be rendered perfectly aseptic. In a case described the dressings were removed on the fifth day; the wound was entirely healed except at the point of emergence of the drainage-tube. Lichtwitz, of Bordeaux,¹¹ Sept. concludes that the emptying of the sinus is more readily affected by blowing air through the inserted catheter than with the assistance of liquids. Catheterization of the sinus is much to be preferred to external incision, when practicable. The latter procedure involves the danger of erysipelas and the necessity of continued external drainage. Moure, of Bordeaux,¹⁴ May 14 in view of the irregular anatomy of the parts, advises that great prudence be exercised when trephining of the frontal sinuses is contemplated. Penetration of the cranial cavity is a possibility not to be overlooked. Operators are inclined to publish their favorable cases and to conceal the unfavorable ones.

In a case reported by J. Bark, of Liverpool,²² Dec. 21, 192 a cyst had eroded the outer wall of the sinus, and so invaded the orbit as to push the eyeball a considerable distance from its normal location. Incision into the swelling, evacuation of a quantity of glairy, honey-like fluid, and drainage and subsequent antiseptic washings cured the frontal trouble, and the eye returned to its normal position. Bronner, of Bradford,¹¹ June recorded a case of bilateral affection of the frontal sinus, in which both sinuses could be syringed out from the nares with a bent double tube. He used the chisel in preference to the trephine in such cases, and laid great stress on the importance of maintaining strictly antiseptic after-

treatment. Dundas Grant¹¹ urged the adoption of trephining in the middle line only in cases of doubt as to which sinus was affected, and agreed that the gouge and mallet were preferable to the trephine in other cases.

Castex, of Paris,²⁴ reports a case in which hysteria simulated an affection of the nose and frontal sinuses. An exhaustive review of the surgery of the frontal sinuses is contributed by Mayo Collier,¹¹ and another on the general subject by Rankin, of Allegheny, Pa.¹

Ethmoidal Cells.—In his Bradshaw lecture Christopher Heath, of London,² quoted Zuckerkandl's recent statement²¹⁶⁶ to the effect that in his extensive dissections he had not observed necrosis of the ethmoid in a single instance; on the contrary, he had noticed that "the bony part which exists in the basis of some polypi became elongated and softened." He (Zuckerkandl) therefore criticised Woakes's statements concerning the existence of such a condition as "necrosing ethmoiditis," and especially the operative conclusions which the latter drew from his ideas on the subject. This gave rise to a spirited discussion, in which Woakes,² Sidney Martin,² W. Spencer Watson,² G. C. Wilkins,² and S. J. Taylor,² all of London, took part. S. Martin, it will be remembered, was the histologist who had prepared the report upon twenty specimens of ethmoiditis submitted by Woakes to the Section of Surgery at the annual meeting of the British Medical Association at Bournemouth in 1892, after Zuckerkandl's statements were published. In a disclaimer² alluding to this report Martin states that, out of the twenty specimens submitted, "in two necrosis of the bone was present, the arteries in these specimens being greatly thickened and their lumen nearly occluded," etc., and ends his letter with the remark that he "cannot see in what way these results confirm the existence of 'necrosing ethmoiditis.'" Woakes naturally appeals to this statement (a repetition of that previously made) to show that Martin proves the presence of necrosis in 10 per cent. of the specimens examined,—a fact that cannot be denied.

G. C. Wilkins² says that frequently in cases of nasal polypus, both before and after removal, he has found spicules of loose bone usually in the upper part of the middle turbinate body. But he has more frequently met with the clinical indications of "necrosing ethmoiditis" in the absence of nasal polypi, and this because he

believes that since surgeons have taken notice of nasal troubles the public has been shrewd enough to avail itself of all the means of treatment placed at its disposal as early as possible. Allowing that the membrane covering closely the nasal aspect of the ethmoid is muco-periosteal, and, further, that it dips into the spongy structure lining the spaces of the bone, why, he asks, should this bone differ from others in the body in being unaffected by prolonged periostitis?

After all the negative evidence published, Wilkins's statements are refreshing, but they cannot be attacked until a purer motive than prejudice shall have entered the field of inquiry. To prove or disprove the assertions of a man of the ability of Woakes requires careful work,—*i.e.*, more than the casual and indifferent introduction of any kind of probe somewhere in the neighborhood of the proper spot, the entire procedure being influenced by a desire *not* to find. When Woakes's methods shall have been carried out to the letter by his critics, granting them equal competence, their opinions will have more weight. Even Zuckerkandl's statement that he had not observed necrosis in a single case does not establish the rule that necrosis cannot occur in the region in question, as demonstrated by Sidney Martin's report. Nearer the truth is Spencer Watson when he expresses the opinion that necrosis as an accompaniment of nasal polypi is extremely rare, and should be regarded, when present, as a remote result of polypi, and not as a cause. Still nearer the truth was Dundas Grant,^{11 Aug.} who, in the course of a discussion, remarked that in most cases of polypus there was no caries, but that possibly, by instituting a careful search, exposed bone would be discovered more frequently than was at present thought to be the case.

In a case of ethmoiditis complicated with caries, reported by Wyatt Wingrave,^{11 Aug.} the histological changes were practically identical with those described by Woakes under a different interpretation. "They, however, substantially corroborate much that Woakes has advanced, and may assist the further consideration of so important a disease whose existence is not only doubted, but even denied, by surgeons of repute."

Cases of suppurating ethmoiditis are reported by W. R. H. Stewart, of London^{6 Apr. 29}; Goris, of Brussels^{286 May, June}; J. W. Barrett, of Victoria^{285 June 15}; and J. H. Bryan, of Washington.^{1 Jan. 28} The latter

case terminated in caries. A. Ruault, of Paris,¹¹ contributed a new sign of suppuration of the anterior ethmoidal cells.

When electrical transillumination is practiced after the Volto-lini-Heryng method, in subjects healthy and possessing normal translucidity without modifications due to anomalies of conformation and thickness of the osseous walls, a certain number of zones exist in the adult more strongly illuminated than the neighboring parts. When the lower part of the face corresponding to the dental arches and the alveolar borders of the superior maxilla is very clearly illuminated, the middle part of the cheeks is darker as far as the inferior orbital arch, and above this there is a zone more clear, in the form of a cross, answering to the lower eyelid. But when an electric lamp giving sufficient light is applied in a certain manner, there is on each side, at the level of the nasal bones, a clear zone, irregularly oval, less bright than the neighboring palpebral region, but clearly distinct from the other darker parts. These clear zones are often absent when the lamp is placed in the middle of the mouth on the median part of the back of the tongue, for, according as the subject has a narrow nose, or tumefaction of the inferior turbinateds, the illumination of the upper part of the nose is poor; the luminous rays, having traversed the palatine arch at the level of the floor of the nasal fossæ, are arrested by the projection formed by the turbinateds, especially the inferior. But if care is taken to place the lamp in the mouth laterally,—*i.e.*, below the lower wall of the maxillary sinus and not below the floor of the nasal fossæ,—the region of the proper bones of the nose is clearly illuminated, the luminous rays traversing the maxillary sinus and the anterior ethmoidal cells. This fact has not yet been noticed, probably because observers have been directing their attention to examination of the transparency of the cheeks and lower eyelids; but it is easy to see if a lamp of sufficient intensity is employed. In the author's opinion the presence of obscurity of the region of the nasal bones in a subject presenting a purulent flow from the meatus of the same side, at the same time as translucidity of the corresponding maxillary sinus, is a diagnostic point of great value. It indicates suppuration in the region of the anterior ethmoidal cells, whether primary or secondary to inflammation of the frontal sinus. He has found this sign present a number of times in patients with inflammation of the

frontal and ethmoidal sinuses, and in those with syphilitic lesions of the same regions; and although he is far from attributing a pathognomonic value to it, he considers it to be a sign the detection of which should not be neglected.

Tumors of the Ethmoid.—In the opinion of C. S. Bull,^{1,21} a morbid growth confined to the ethmoidal cells gives rise either to no symptoms or merely to paroxysmal headache. The orbital symptoms are the same as those of tumors of the orbit. The motility of the eyeball is limited; vision may be slightly affected, or there may be complete blindness. The visual field may not be involved. If the tumor has entered the naso-pharynx the mouth is more or less open and speech nasal; later there is loss of sense of smell; there may be more or less continuous dropping of clear fluid from the nose, even in solid tumors, and there may also be orbital or palpebral emphysema and haemorrhage from the nostrils.

Sphenoidal Sinuses.—Max Schaeffer, of Bremen,^{69, No. 47, 92} has since 1890 observed nineteen cases of acute and fifty-three cases of chronic inflammation of the sphenoidal sinuses, and gives an interesting clinical description of the affection. The acute form consists of a catarrh consecutive to a similar condition of the nasal fossæ or naso-pharynx, announced by pain in the centre of the head or the occiput, dizziness, a sense of compression under the eyes, and increase of fever. Examination shows the disappearance of the furrow between the middle turbinated and the septum, and in its place a bright-red swelling due to the projection outward and downward of the sphenoidal sinus. A muco-pus is present, and, if removed with cotton, is immediately reproduced.

The author advises the passage of a sound, after previous application of cocaine, through the natural orifice of the sinus, which is usually found without much difficulty at the point of swelling mentioned. If the orifice cannot be found, the wall of the sinus should simply be incised and the sound removed, the patient being made to blow the nose energetically; or the Politzer douche may be used, either method causing the evacuation of the muco-pus contained in the cavity; irrigation with $\frac{1}{100}$ sublimate solution, and with iodoform in the direction of the sinus. Iodide of potassium should be given daily to render the secretion more fluid.

The author has thus obtained a cure in all his cases, the shortest duration of the disease having been fifteen days, the

longest not exceeding two months. The patients were 11 men and 8 women; in 10 cases the disease occupied both sinuses, in 6 the right, and in 3 the left. In 4 cases it followed influenza, in 1 nasal syphilis, and in another the extraction of nasal polypi,—an etiological factor already mentioned by Ruault.

The chronic form may be consecutive to the acute if the latter be not treated in time, or may appear in the course of chronic rhinitis. Its development may also be influenced by certain dyscrasias (scrofula, tuberculosis, syphilis, lupus). It frequently co-exists with nasal polypi, and the author believes that in such cases the neoplasms may either be consecutive to the disease or antecedent to it, and thus favoring its development. The subjective symptoms consist of a purulent secretion which forms fetid crusts in the naso-pharyngeal cavities, an odor more perceptible to the patient than to those around him, dizziness, intellectual torpidity and depression, and a painful sense of pressure above the root of the nose. Objectively there is enlargement of the organ, while examination shows hyperplasia of the mucous membrane of the septum near the middle turbinate, causing diminution of the furrow between them. The opening of the sinus is also enlarged. There is dry pharyngitis, with the formation of crusts on the pharyngeal vault. Ulcerous perforation of the inferior wall of the sinus may occur, so that a sound introduced through the nasal fossa enters the naso-pharynx. The pus may also enter between the processes of the vomer, and cause perforation of this bone.

Schaeffer advises, as treatment, the curettage of the diseased cavity and irrigations with sublimate and iodoform, as in the acute form, and the use of iodides afterward.

He has observed the chronic form in 19 men and 34 women, 13 times on the right and 25 times on the left side. Cure was obtained in 39 cases, whenever the affection was not dependent upon an incurable pathological condition of the nasal fossæ, such as ozæna. Even in such cases the treatment brought about notable improvement.

According to Moure,³ _{May 17, July 1}² inflammation of the sphenoidal sinus may be of two kinds. Acute inflammation occurs in connection with an ordinary coryza, the symptoms of which they aggravate. They readily yield to emollient medication. Chronic inflammation and empyema of the sinus is a very common affec-

tion, and is the cause of many cases of chronic naso-pharyngeal catarrh, which cannot be cured by local applications, such as curetting, etc. The disease is characterized by pains in the posterior part of the orbits and at the back of the neck. Pus coming from the sinus collects in the posterior half of the nose between the septum and middle turbinated bone, the mucous membrane of which region is generally covered with polypoid growths. In treating these cases Moure advises that a catheter should be passed backward toward the sphenoid bone along the middle meatus and close to the septum. As the catheter passes backward the tip is turned up until it is felt to be in a small hole, when it is pushed backward into the sinus. Irrigation with warm antiseptic solutions is then carried out. If the orifice of the sinus cannot be found, it is advised to make an artificial one through the anterior wall, which is very thin. If the catheter cannot be passed on account of the middle turbinated bone, part of the bone should be removed. Further treatment by irrigation, insufflation of powders, etc., is adopted, according to the case. Great care must be taken in the operation. In the discussion Cartaz said that in many cases diagnosis was not possible without a surgical operation, owing to the swollen condition of the mucous membrane.

In a case reported by Zorkendorfer¹³⁶ fatal meningitis followed empyema of the sphenoidal sinus. The patient was brought to the clinic in a comatose condition, and all that could be ascertained was that she had been taken, two days before, with fever and pain in the thorax. Microscopical examination revealed the existence of purulent meningitis, the pus containing the Fraenkel-Weichselbaum pneumonia diplococcus.

Tumors of the Sphenoid.—C. S. Bull, of New York,^{1, 11} Jan. 21, May states that when a pathological process is limited to the sphenoid antrum the subjective symptoms are either entirely absent or there may be severe pain in the head. If the disease spread, symptoms arise pointing to the sphenoid as the seat of the disease, such as blindness, from compression of one or both optic nerves, and the visible appearance of a growth in the naso-pharynx, ethmoid, orbit, or skull. The entrance of the growth into the cranial cavity may occur without any subjective symptoms, or there may be severe headache. If very rapid, meningitis or cerebral abscess will result. Ophthalmoscopically are found papillitis or atrophy

of the optic nerves. Tumors of the sphenoid may perforate the middle fossa of the skull without causing blindness, and this may be unilateral. If an orbital tumor rapidly cause blindness, and the latter starts from the temporal side of the field and leaves the region of the macula lutea unaffected to the last, and if at the same time a growth appear in the naso-pharynx, it is probable that the growth began in the sphenoid antrum.

NASO-PHARYNX.

Ziem, of Dantzig,¹¹⁶ _{Dec., '92} recommends the routine employment of palpation of the naso-pharynx as superior, in many ways, to posterior rhinoscopy. The necessary relaxation of the palate is secured by the pronunciation of the French "on." The lips of the Eustachian orifice must not be mistaken for abnormal tumefactions, but the points obtained as to the consistency, as well as the form, render the method decidedly superior to visual study, in his opinion. Bronner² _{Mar. 25} insists upon the great importance of naso-pharyngeal disease in the production of aural affections, and upon the permanent effects of even passing disease, pointing out that many adult cases of middle-ear deafness showed, in photographs taken in early life, unmistakable evidence of post-nasal growths, which had since vanished.

Naso-Pharyngeal Catarrh.—Although several interesting reviews of the subject have been contributed during the year, nothing new has been advanced. Hajek, of Vienna,¹³⁶ _{July} coincides with the majority of his brother specialists in the belief that Tornwaldt's theory as regards the recessus medius should be set aside, since the identical trouble described by him as limited to that crypt could also be observed in the other recesses of the naso-pharynx. Again, an apparently localized inflammation is soon demonstrated, involving the entire adenoid mass. He employs Gottstern's knife and subsequent cauterizations with marked success in many cases.

E. J. Birmingham, of New York,² _{Mar. 11} insists upon the importance of cleanliness, which he considers as the most essential part of the treatment, and recommends for the purpose a modification of Dessar's douche-cup. W. C. Braislin, of Brooklyn,¹ _{Apr. 22} concludes that the etiology of not a small proportion of chronic naso-pharyngeal and tonsillar disorders may be traced to a general

pathological condition, at present vaguely termed "rheumatic diathesis," and adduces an interesting case in point. Posthumus Meyjes, of Amsterdam,^{987 Sept. 4, '92} considers a solution of ichthylol, one-half of 1 per cent., applied by the patient himself every two hours, as very efficient.

Adenoid Vegetations.—A. Michel Dansac, of Paris,^{37 July} in an elaborate article, studies the pathological anatomy of this form of growth. Of thirty-two cases examined, seventeen were in patients from 5 to 14 years. He divides adenoid vegetations in the young into three classes,—scrofulous, lymphadenomatous, and syphilitic. The first class are soft, irregular in places, more or less furrowed. There is generalized peri- and inter-follicular hyperplasia, with degeneration of the central elements of the follicle, and proportionate perivascular sclerosis from secondary inflammation, leading to fibrous, cicatricial, annular contraction.

In the second class the tumors are more voluminous, the consistence is firm and hard, as in adults; there is no lobulation with furrows. The lymphoid tissue is entirely hypertrophied, the normal relation of the elements being preserved in this general hyperplasia. The tissue represents an hypertrophied ganglion or tonsil. In the third form the characteristics of the other two are combined. In the adult scrofulous vegetations seem to be met with only in women, but in these cases the scrofulous adenoid tissue has a tendency to become transformed into lymphadenomatous tissue. In the adult pharyngeal lymphadenitis assumes either a pure form of lymphadenitis, a degenerating form, or mixed scrofulous and syphilitic forms.

Vinton, of New York,^{59 June 17} studied the frequency of these growths in children supposed to be healthy. Of 550 examined in the New York public schools, but 20 per cent. could be classed as normal; in 60 per cent. the adenoid vegetations were more or less evident; 20 per cent. presented enlarged tonsils, while 12 per cent. had both varieties of growths combined. Arthur A. Bliss, of Philadelphia,^{9 Nov. 19, '92} examined 415 young deaf-mutes. Of these, 79 were found to have adenoid vegetations of the vault, causing partial occlusion of the cavity or pressure upon the Eustachian openings.

In a report based upon 200 observations J. W. Barrett and Percy Webster, of Melbourne,^{11 Nov.} express the opinion that post-

nasal growths are responsible in Australia for a vast amount of general disease, and especially deafness. Of the 200 cases, 110 were males and 90 females, and the average age—males, 9.47; females, 9.05. Subdivided in quinquennial periods, there were:—

		Males.	Females
Under 5 years	.	10	0
5 to 10 "	.	51	50
10 to 15 "	.	25	30
15 to 20 "	.	7	7
20 to 25 "	.	5	0
25 to 30 "	.	3	0
30 to 35 "	.	2	1
35 to 40 "	.	1	0

Thirty-eight were suffering from chronic suppurative inflammation of the middle ear on one or both sides. Out of 19 cases selected for detailed examination, 15 were mouth-breathers, 13 had enlarged tonsils, and 9 only suffered from anterior nasal obstruction. The details of these cases and the results obtained are shown in the annexed charts (pages D-47 and D-48).

H. Drinkwater, of Wrexham,^{June 24} reports the case of a boy, aged 10 years, to whom he was called for haematemesis. The blood was, according to the mother, neither coughed up nor vomited. She stated that the child would suddenly rise up in bed and empty his mouth of blood. The author once witnessed the loss of about 8 ounces (250 grammes) in this manner. For several days he failed to discover the source, the lungs and stomach being healthy. After about ten days the haemorrhage ceased. A fortnight afterward, however, it recurred, and, arriving while the child was asleep, he observed that he was breathing by the mouth. This led him to suspect adenoid vegetations, and, passing his finger behind the soft palate, the naso-pharynx was found full of these growths. He scraped the neoplasms away with the finger-nail, and no haemorrhage has recurred since. A case of the same kind is described by P. Macleod Yearsley.^{July 22} A case of death under chloroform administered for the removal of adenoid vegetations and tonsils is reported.^{Aug. 5} J. F. W. Silk, of London,^{Mar. 4} emphasizes the view that whatever other precautions be taken, when once anaesthesia has been induced, as little anaesthetic as possible should be given. Dundas Grant, of London,^{Aug. 19} reiterates his commendation of nitrous-oxide gas for this class of operations, which agent certainly merits trial, in the face

ADENOID VEGETATIONS (BARRETT AND WEBSTER).

Adenoid vegetations.]

DISEASES OF NASAL CAVITIES, ETC.

SEX.	AGE.	EAR DISEASE.	DURATION.	ORAL, NASAL, AND OTHER SYMPTOMS.	GENERAL HEALTH.	FEATURES.	PALATE.	MEMBRANES.	HEARING.	OPERATION.	RESULT.
M.	5 years.	C.S.C.M.E. ¹ , R. and L.	4 years.	Snores. Oral respiration. Ch. rhinitis. Enlarged tonsils.	III-nourished. Anemic. Strumous-looking. Enlarged glands.	Thin, stunted.	Arched.	Perforated.	Very deaf.	1, 25, '92.	3, 14, '92—R. 24; L. 18. Much brighter and healthier. 5, 20, '92.—R. 25 in.; L. 25 in. Does not snore. Nasal respiration.
F.	10	C.C.M.E. ² , R. and L.	4 years.	Snores. Oral respiration. Dead voice. Rhinitis.	III-nourished. Dull, awkward, flabby. Thick edematous skin. Strumous.	Not arched.	Catarrhal and depressed.	R. 2 in. L. 4 in.	1, 20, '92.	3, 19, '92—Hearing much improved. Healthy, bright look with supple healthy skin. Lost to a large extent the strumous look.	
F.	3	C.S.C.M.E. and C.C.M.E.	1 year.	Breathing heavy. Large tonsils.	A strumous-looking, ill-nourished.	Thick.	High, arched, and broad.	Partially destroyed.	Very deaf.	1, 21, '92.	Much improved for a time. Recurred and relapsed. 6, 23, '92.—Mem. healthy. Very slightly deaf. Lost strumous look, and gained a fresh, healthy complexion.
M.	13	C.C.M.E., R.	.....	Large tonsils.	Healthy and strong.	Gross, strumous.	Normal.	(?) Normal.	R. 25 in. L. 25 in.	1, 22, '92.	4, 4, '92.—H. = n., R. and L.
M.	8	C.C.M.E., R. and L.	5 months.	Pharyngitis. Nasal obstruction. Tonsillitis. Enlarged cerv. glands.	Strumous, but vigorous. Subject to colds.	Strumous.	Normal.	Catarrhal and depressed.	R. 2 in. L. 35 in.	2, 5, '92.	5, 20, '92—H. = n., R. and L. General health and aspect much improved.
F.	6	C.C.M.E.	.....	Not noticed to be deaf, but earache five weeks. Large tonsils.	III-nourished and flabby. Constantly having colds.	High and broad.	Red, Ac. Cat. M. E.	R. 30 in. L. 35 in.	2, 5, '92.	5, 20, '92—M. is depressed, red. H. nearly normal.	
F.	16	C.C.M.E.	.....	Ch. rhinitis. L. nostril obstructed.	Normal. Broad and low.	Depressed and scarred.	R. 5 in. L. 1 in.	2, 5, '92.	5, 20, '92—M. is depressed, red. H. nearly normal.		
F.	5	C.C.M.E.	12 months.	Earache and deaf. Snores and sleeps badly. Enlarged tonsils.	Palp. delicate, refined, intelligent. Constantly having colds.	.....	Red, depressed, scarred.	R. 10 in. L. 5 in.	3, 9, '92.	7, 20, '92—R. 14 in.; L. ½ in. Mem. depressed.	
F.	6	C.C.M.E.	18 months.	Nasal obstruction. Open mouth. Snoring. Oral respiration. Tonsils large.	Stupid expression, mouth open, and nose pinched.	High, but broad.	Red and sunken.	R. 4 in. L. 4 in.	3, 21, '92.	8, 8, '92—Not noticed to be deaf. Much brighter, sleeps better, does not snore. Appetite improved, and not as subject to colds.	
									8, 18, '92—R. 10 in.; L. 10 in. Redness gone. Better health. Not tuffed up. More free. Lost stupid look.		

¹ Chronic suppurative catarrh of middle ear.² Chronic catarrh of middle ear.

ADENOID VEGETATIONS (BARRETT AND WEBSTER)—Concluded.

SEX.	AGE.	EAR DISEASE.	DURATION.	ORAL, NASAL, AND OTHER SYMPTOMS.	GENERAL HEALTH.	FEATURES.	PALATE.	MEMBRANES.	HEARING.	OPERATION.	RESULT.
F.	Years. 15	C.C.M.E. R. and L.	18 months	Ch. hyp. rhinitis. Snores. Lacks vitality. Pale. Dead voice.	Vacant expression, mouth open.	.....	Depressed and opaque.	R. 8 in. L. 5 in.	2, 23, 92.	Immediate benefit. 6, 22, 92.—R. 12 in.; L. 16 in. Snores still. Rhinitis the same. Brighter and better in health. Head feels clearer. 7, 19, 92.—R. 12 in.; L. 25 in.	
M.	5	C.C.M.E., R. and L.	12 months.	Snores.	.....	Red and sunken a little.	R. 15 in. L. 12 in.	3, 28, 92.	4, 25, 92.—R. 36 in.; L. = n.	Second operation. Much improved in health. Parents do not notice any deafness.	
F.	7	Sub. Ac. C.M.E., R. and L.	1 month.	Earcache and restlessness. Delicate. Nose free. Throat cough.	.....	Sunken and red.	Contact R. and L.	4, 5, 92.	4, 26, 92.—R. nearly normal; L. 20 in.; Redus gone. 7, 13, 92.—Fresh Ac. C. M. E. 11, 36 in.		
M.	15	C.S.C.M.E., R.	Many years.	Ch. hyp. rhinitis. Palms Anemic. Strumous-looking. Enlarged tonsils. Dull, heavy look.	Strumous.	High, arched, and narrow.	B. destroyed. L. depressed.	5, 30, 92.	8, 16, 92.—R. ½ in.; L. 80 in. R. memb. healing. General health greatly improved. Brighter, more active, and robust. Cl. rhin. and pain in head better.		
F.	10	Sub. Ac. C.M.E.	3 years.	Snores. Throat cough. Strumous aspect. Lively. Subject to colds. Cl. Enlarged cervical glands. Enlarged tonsils. Tina tarsi.	Long, oval face. High, arched, and narrow. Thick lips.	.....	.....	6, 17, 92.	7, 22, 92.—H. = n. Memb. = n. Does not snore. Cough and rhinitis better. Tonsils removed.		
M.	6	Sub. Ac. C.M.E.	Pain 3 weeks.	Snores. Very restless. Large tonsils.	Broad nose. Thick ale.	High and arched. Depressed and red.	R. 36 in. L. 6 in.	7, 6, 92.	7, 13, 92.—R. 36 in.; L. contact. Brighter since operation, but still snores, and is restless.		
M.	9	C.C.M.E.	3 years.	Earache. Snores. Ch. rhinitis. Enlarged tonsils.	.....	High, arched, and narrow.	.....	7, 25, 92.	8, 8, 92.—H. = n. Does not snore. Sleeps better. Red memb. gone.		
M.	10	C.C.M.E.	9 months.	Snores. Oral breathing. Enlarged tonsils.	Looks strong and healthy. Cervical glands enlarged.	Narrow and arched.	.....	7, 25, 92.	9, 8, 92.—R. 14 in.; L. = n. Great improvement. Does not snore. Better health. Membranes a little sunken.		
F.	6	C.C.M.E.	12 months.	Snores. Nasal obstruction. Enlarged tonsils.	Delicate. Enlarged cervical glands.	Well formed.	High and narrow. Sunken and red.	R. 8 in. L. 4 in.	5, 6, 92.	9, 8, 92.—R. = 40 in.; L. = 25 in. Membs. not red. Does not snore. Breathes through nose.	
F.	14	C.C.M.E., L.	Some years.	Ch. rhinitis. Snores. having colds.	Always In good health, but feels heavy about head. Not strumous.	Well formed.	High and broad.	L. sunken a little.	8, 19, 92.	Ten days later H. L. = n. Does not snore. Feels lighter in head. Describes the change as wonderful.	

of such regrettable occurrence as the foregoing. Nothing new in the way of treatment has been proposed. H. Clark, of Buffalo,¹⁷⁰ rightly condemns the finger-nail method of removal,—a procedure quite at variance with antiseptic surgery,—and recommends the Gottstein curette, as modified by Lefferts.

An admirable review of the subject, with photo-lithographic illustrations, was contributed by T. R. French, of Brooklyn.¹⁵⁷ Papers of the same kind were published by L. Beco, of Liége,²⁹³ and P. McBride, of Edinburgh.¹⁰⁷⁷ July 19

• *Naso-Pharyngeal Polypi*.—C. Poli, of Florence,⁶²⁴ Nov., '92; June⁶⁷³ reports the case of a young man, 19 years old, suffering from an attack of epistaxis, who had a naso-pharyngeal tumor, 10 centimetres (4 inches) in circumference, and extending from the pharyngeal vault to the third cervical vertebra. He had decided to operate by Nélaton's method, when a rapid increase in the size of the tumor demanded tracheotomy. The patient died, in a comatose state, two days afterward. An autopsy demonstrated that the tumor arose from the septum nasi, the posterior ends of the middle and superior turbinated bones, and the posterior part of the cribriform plate of the ethmoid bone. Microscopical examination showed that it was very vascular, and contained large sinuses; its surface was covered with pavement epithelium. The author reaches the following conclusions: 1. Naso-pharyngeal tumors, though generally inserted into the basilar apophysis, may occasionally take their origin from the nasal fossæ. 2. The selection of the operative method should depend upon an exact knowledge of the seat of origin. (Report of Corr. Editor Massei, Naples.)

Conitzer⁶⁹ Dec. 22, '92 describes one case, and Chapay, of Besançon,¹⁴ Aug. 25 two cases of hairy pharyngeal polypi,—curious growths, which, when *in situ*, appeared very light colored against the inflamed pharyngeal wall, and are covered with a glistening white structure similar to the external skin, and full of small blonde hairs. In Conitzer's case the structure consisted of a central cartilaginous nucleus surrounded by fatty areolar tissue, and the whole was covered with a very typical skin furnished with hairs, sebaceous glands, sweat-glands, and another larger form of gland which is not accurately described.

The following table in Conitzer's paper gives a summary of reported cases, and is of considerable interest:—

No.	Author.	Age.	Position of Growth.	Chief Const't	Covering.	Peculiar Constituents.
1	Lambel.	6 months.	Pharynx.	Fat.	Skin, with hair and sebaceous glands.	
2	Clerault.	Newborn infant.	Hard palate.	"	Skin, with sweat-glands.	Striated muscle.
3	Barton.	22 years.	Soft palate.	"	Skin, with sweat-glands.	Fibrous cartilage.
4	White.	3 years.	"	"	Skin, with sweat-glands.	Elastic cartilage.
5	Schuchardt.	6 months.	Left side of posterior pharyngeal wall.	"	Skin, with sweat-glands.	Striated muscle.
6	Arnold.	13 years.	Soft palate.	"	Skin, no sweat-glands.	Elastic cartilage.
7	Goschler.	Newborn infant.	Left side of anterior pharyngeal wall.	"	Skin, no sweat-glands.	
8	Otto.	"	Left side of the posterior part of the soft palate.	"	Skin, sweat-glands and smooth-made fibres.	Hyaline cartilage.
9	Prouealli.	"	Arcus glosso-palatinus.	"	Skin, sweat-glands and smooth-made fibres.	
10	Conitzer.	26 years.	Left side of anterior pharyngeal wall.	"	Skin, sweat-glands and smooth-made fibres.	Hyaline cartilage and lymph-follicles.

Schuchardt believed them to be teratomata, while Arnold considered them as abnormal ectodermoblasts,—an opinion with which Chapay concurs. One of the latter's was a newborn child. In these the prognosis is grave if the growth remains undiscovered, owing to slow asphyxia from insufficient pulmonary expansion. Removal is therefore recommended.

Zaufal⁸⁸ _{No. 11} reports the manual extraction of an enormous growth that extended down the pharynx almost to the orifice of the larynx, nearly filling the mouth when drawn into it. It was grasped between the index and middle fingers and thumb of each hand, and yielded to forcible traction. The haemorrhage was slight, but epistaxis requiring tamponing ensued a few days later; this was followed by bilateral otitis media with rupture of both drum-heads, resulting, however, in no permanent injury to the hearing.

In an elaborate study of the treatment of naso-pharyngeal polypi by electrolysis, J. Normand¹⁰⁶¹ _{Jan. 15} reaches conclusions concurring, in every particular, with those of Bruns, to the effect that electrolysis renders it possible to avoid the severe surgical operations so often required in this class of cases. The proportion of successes so far attained has been 62 per cent., the unsuccessful cases being due to defective instrumentation or to the use of too weak intensities. The bipolar method is recommended over all

others. Massei, of Naples, ¹³⁶ _{Dec. 15, '92} considers the galvano-caustic snare as of primary usefulness in the removal of these growths, but resorts to electrolysis if the neoplasm to be removed cannot be satisfactorily seized. Were surgical measures not out of date with such superior methods as electrolysis at our disposal, the new operation described by Ollier, of Lyon, ¹⁴ _{Aug. 18}—separating the nose from the face above its supra-labial portion by means of a horseshoe incision passing from ala to ala over root of the organ,—would be described at length. The marked advantages of electrolysis over surgical means, in any form of tumor of the vault, are shown in a paper by Ferreri. ¹¹⁰⁵ _{Jan.}

Syphilis.—A case of hereditary syphilis of the naso-pharynx, with marked lesions involving the posterior portion of the hard palate, the soft palate, uvula, and part of the palatine arches, and causing corneal opacity, is cited by L. E. Blair, ⁵⁹ _{Apr. 15} who also reports a case of syphilis of the naso-pharynx with involvement of the sphenoid.

SOFT PALATE.

Anatomy and Physiology.—Livon, of Marseilles, ¹⁴ _{Aug. 27} says that excitation of the roots of the pneumogastric determines contractions of the palato-staphylinus and the pharyngo-staphylinus. Excitation of the superior roots of the spinal produces contraction of the external and internal peristaphylinus. This proves that the vault of the palate is specially innervated by the pneumogastric and spinal at the same time as the facial and glossopharyngeal nerves,—a theory already advanced by Vulpian.

The neuroses of mobility of the soft palate are carefully studied by Rethi, of Vienna, ²¹⁶³ who reaches the following conclusions: 1. While clinical observations prove that disturbances of mobility of the soft palate are caused by diseases of the vagus nerve, physiological experiments and anatomical researches also prove that the vagus nerve is the only motor nerve of the velum palatinum. 2. The motor fibres of the levator veli palatini arise from the roots of the vagus. The ramus internus of the nervus accessorius must be regarded as belonging to the nervus vagus in physiological and anatomical relations. 3. The motor fibres of the levator are always contained in the ramus pharyngeus vagi. 4. The facial nerve does not participate in the motor innervation of the velum palatinum, and a double innervation (of the facial

and vagus) cannot be accepted. 5. Paralysis of the vagus can be produced by hypertrophic tonsils. 6. Paralysis and paresis of the velum from enlarged glands in the neck and hypertrophied tonsils occur more often than is believed. 7. The direction of the uvula cannot be used as a means of determination of the side of the paralysis, because sometimes it inclines to the healthy, sometimes to the diseased side. 8. Degeneration of one side of the musculus azygos uvulae is often observed, so that deviation of the uvula may occur even if the nerves are healthy.

Castex³⁷ May describes a case in which the palate was too short, corresponding with the velo-palatine insufficiency described by Lermoyez³⁷ Mar., '92 last year. The influence of the soft palate in the causation of snoring and stertorous breathing is well shown in a case reported by N. W. Rand, of Monson.⁵⁹ Mar. 4; July 11. It was found that propping up the chin by means of a cardboard support placed on the chest the stertor in an old man dying of apoplexy was quite stopped, to the great relief of the relatives, and possibly of the patient as well.

Tumors.—Cases of *papilloma* of the soft palate and uvula are reported by Clinton Wagner, of New York,¹ Feb. 26 (two), Grazzi,³⁷ and Lublinski.¹³⁶ Jan. 15 While Grazzi considered these neoplasms as quite rarely observed in practice, Wagner refers to the frequency with which they remain unseen,—a circumstance probably due to the fact that when the mouth is opened retraction of the soft palate, uvula, and palatine arches takes place, the growth being thus made to adhere closely to its seat of implantation. He recommends that the pedicle be pulled with forceps and divided as near the surface of the membrane as possible.

In a supposed *adenoma* of the soft palate C. Morton² Nov. 5 found, histologically, large cells ramifying in very delicate connective tissue, in places hyaline. There occurred also areas of imperfectly-formed gland tissue. He traced some of the cell columns into spindle-celled tissue. However, he thought that the tumor was a mixed one, partly glandular, partly of connective tissue, and that it arose from embryonic rudiments, in which sense it was congenital. He referred to cases recorded by Sir William MacCormac and Stephen Paget. A case much of the same kind, and termed by him *lymphangioma* and *angio-lymphoma*, is described by Labit.¹³⁶ No. 24

A *sarcoma* of the soft palate, soft at its centre and simulating a peritonsillar abscess, is described by Hajek, of Vienna.¹³⁶ In a case of sarcoma reported by W. K. Simpson, of New York,¹¹ the patient had had papillomata, which were removed with the cautery knife. On recurrence the entire soft palate was removed, two months after which the growth again recurred, the patient soon dying. The primary diagnosis of papilloma in this case was probably erroneous. A case of alveolar sarcoma of the soft palate is also reported by T. V. Fitzpatrick, of Cincinnati, O.¹¹

In a case of *epithelioma* reported by Schiffers, of Liége,³⁷⁸ Aug. 17 the starting-point was the uvula, the left palatine arch being soon invaded. Galvano-cautery and thermo-cautery were employed to remove the growth. The subjective symptoms were insignificant; at the time of the reading of the paper no recurrence had taken place.

Pepper,²² Dec. 28, '92 for a case of the same kind, but more advanced, removed the whole of the soft palate, one-third of the posterior wall, the whole of the side wall of the pharynx, the base of the tongue, and the tonsil, with ligature of the lingual and facial. In the course of the procedures he cut the gustatory nerve, which he came across at the beginning of the operation, stretched like a tight cord, considering this as an advantage in the prevention of pain. H. D. Hamilton, of Montreal,²¹⁶⁸ Apr. reported a fatal case in which the neoplasm had started as a small sore on the anterior face of the soft palate. Successive attacks of influenza greatly aggravated the severity of the disease, producing exacerbations, which subsided after each attack.

In a case of *lupus* of the palate, tongue, larynx, and nose, reported by Lennox Browne, of London,¹¹ Apr. treatment by the usual measures proving unsatisfactory, injections of Kleb's tuberculocidin were resorted to. At the time of the report the patient was showing marked signs of improvement. A case of acute perforating tuberculosis of the soft palate was progressing very satisfactorily under injections of cantharidate of soda and local applications of acetic acid, when, to the annoyance of the treating physician, Talamon,³¹ Sept. 2 the patient left the hospital.

Stenosis of the Isthmus.—Cartaz, of Paris,²⁸⁶ Mar. Apr. in an exhaustive review of the subject, basing his study upon thirty-seven cases, including two unreported cases observed by Lubet Barbon, states

that syphilis is by all means the most frequent cause of the condition, which is most frequent in adults. Surgical treatment is both difficult and dangerous, unless the affection is of recent date. It may be tried in cases of simple adhesion, without thickening; but if there is cicatricial retraction, with thickening, the result is doubtful, and perforation, maintained with a dilator, should only be attempted. In a case of the author's the patient refused operation, and he was obliged to limit himself to irrigations to remove the collections of mucus from the nasal cavities. Cases of adhesion are reported by Farlow,⁹⁹ June 8 and Coolidge, of Boston,⁹⁹ June 8 and Conétoix,¹²⁷ Mar. 12 all presumably of syphilitic origin.

Hajek, of Vienna,⁵⁷ No. 11 to restore nasal respiration, perforates the adhering velum as close to the pharyngeal wall as possible, maintaining the opening patulous until the formation of lining membrane by means of tampons.

UVULA.

Anatomy and Physiology.—Berens, of Philadelphia,¹²¹ May, 11, in an examination of 3000 throats, found 84 cases in which the uvula presented some anomaly subdivided as follows: completely separate, 2; worm-like shreds, 8; supernumerary, 4; deeply cleft, 14; attached to other parts, 2; absence, 2; fish-tail shaped, 39; pendulum, 2; hypertrophied, 11. The "pendulum" form consisted of a shred of tissue, one and a half inches long, attached to the uvula, and lying on and behind the epiglottis. It had excited a great deal of cough, and caused much loss of flesh. The author considers that the uvula does not act as a "dropping-stone" to keep the epiglottis and larynx moist, and by contact to keep the pharynx moist, as some authorities think, because in the two cases of congenital absence there was no dryness of these parts.

Acute Infiltration.—In a case for which Le Jeune²⁶ Feb. 1 was sent in great haste for a supposed pharyngeal foreign body, he found the uvula distended to the size of an olive and purple in color. An incision with a bistoury gave immediate relief with the exit of the effused blood. She had been singing, and had made extreme and prolonged efforts to reach a note beyond her compass, a possible explanation. A case of haemorrhagic infiltration of the uvula and tonsils, caused by a bristle, is reported by Fisher, of Heidelberg.⁶⁹ No. 42 Another of intermittent and finally permanent oedematous

swelling of the uvula and soft palate is reported by Hopkins. ²² Feb. 22
The patient had been suffering from "bronchitis and fibroid lung." There was also much thickening of the aryteno-epiglottidean folds and false vocal bands. With the finger the soft palate felt hard and thick, with a thick, rounded border. Occasionally she had had attacks of acute œdema of the pharynx. Both the anterior and posterior pillars projected a good deal, and were gelatinous in appearance. On admission a small gelatinous polypus could be seen in the right nostril.

Hypertrophy.—De Blois, of Boston, ¹¹ Nov. prefers galvano-cautery to the knife or scissors in operations on the uvula. The parts are first thoroughly sprayed with cocaine; the platinum loop is then passed around the appendage, and as soon as the cautery is felt on the posterior surface of the uvula it is drawn tight by the palatine muscles, and by pulling in an opposite direction with a pair of forceps the cut can be nicely beveled; when the wound heals it leaves a well "tapered" stump. There is no hæmorrhage, and the after-pain is not so severe as when the uvula is clipped off with the knife or scissors. Knight, of Boston, in the discussion following the reading of the paper, said that for years he had always drawn the relaxed membrane so far forward that when he used the scissors the cut is an oblique one and the raw surface presents entirely behind, thus reducing the suffering and the period of resolution. [I called attention to this point in 1885, ²¹⁶⁹ and devised scissors drawing the tip of the uvula forward automatically.]

PHARYNX.

Embryology, Anatomy, and Physiology.—E. Tettenhamer describes, ¹⁰⁰⁶ _{Mar., V.7, '92} ²¹⁷⁰ in connection with open pharyngeal clefts, a human embryo, with at least thirty-four protovertebræ. The second, third, and fourth clefts were found open and the ectoderm continuous with the lining membrane of the clefts. It is of interest to note that even in man these clefts, whose significance lies only in the common vertebrate ancestry, occasionally or temporarily occur.

Bawden ¹⁰⁰⁶ _{June} describes a branched diverticulum immediately behind the pharyngeal velum of the duct.

Bonnier ²⁸⁶ _{Mar., Apr.} studied the mechanism of deglutition, and of the opening of the Eustachian orifice during this process in a

syphilitic individual, in whom the palatine tissues had been destroyed along with considerable of the bony frame-work, and came to the conclusion that the tubo-tympanic function preserves its integrity, notwithstanding the absence of the internal and external peristaphyline muscles, and of the palatine aponeuroses.

Hæmorrhagic Pharyngitis.—Natier, of Paris ¹⁵¹_{Aug. 4} reports a case of hæmorrhagic pharyngitis, and reviews the literature of the subject, quoting Rosenthal, Cartaz, Hunt, and Tscheinmann. The condition would seem to be of trifling importance, except in relation to diagnosis, although in the author's case the bleeding persisted intermittently for several days, and in Rosenthal's for many hours. Gargling with some haemostatic or, in the case of localized bleeding, touching the point with nitrate of silver or the galvano-cautery suffices to arrest the bleeding.

Infectious Angina.—Périgord ¹¹⁴⁵_{Aug.} and Ferras ¹¹_{Oct., '92} give detailed descriptions of cases of this affection witnessed by them. W. D. Booker ⁷⁰⁴_{Oct., Nov., '92; Jan. 14}² examined twenty-three cases occurring during an epidemic of scarlatina in Baltimore, characterized by the frequency of complication with pseudomembranous angina. Eleven cases in which this complication was well marked were examined; Loeffler's bacillus was not found in any one of them, but from all numerous colonies of streptococcus were obtained, and in all but two staphylococci were also present, though in smaller numbers. In one case (an adult) there was no rash, but children in the house had scarlet fever; in this case the membrane contained a nearly-pure cultivation of streptococci. In two cases of membranous angina, complicating measles, a streptococcus was found, and one was accompanied by a large number of staphylococci (*aureus*). In a case of membranous angina in the adult, without any reason to suspect any exanthem, a streptococcus was found in almost pure culture. In three cases of scarlet fever with sore throat and in three cases of follicular tonsillitis the streptococci were present in large numbers, although there was no membrane. As to the variety of streptococcus present, two leading types could be distinguished, but it could not be said with any certainty that they were different species; one of the varieties was probably associated with the more severe cases. The resemblance of the appearances in these cases of membranous angina to diphtheria was close in all the cases, and in some it was quite impossible to make a diag-

nosis. In others there were some points which would have at least raised a doubt. The symptoms enumerated may be contrasted in the following table:—

TRUE DIPHTHERIA.	FALSE.
<i>Membrane</i> : white, thick, tough; can be stripped off in large shreds.	Yellow, cannot be stripped off in large shreds.
<i>Suppuration</i> exceptional.	Tendency to suppuration and ulceration marked.
<i>Local process</i> spreads on surface by continuity.	Tends to affect deeper structures.
<i>Extends</i> to air-passages.	Extends to ear, seldom to air-passages.
<i>Fever</i> : highest in early stage; tends to fall after a few days.	More active, without tendency to subside after initial stage.
	Adenitis accompanied by redness, and swelling pronounced.
	Pain on swallowing great.

Pharyngo-Mycosis.—Cases of this affection were reported in detail by Dundas Grant and W. Wingrave, ¹¹ Apr. Garel, ¹¹ June Brown Kelly, ²¹³ Aug. Labit, ¹³⁶ Mar. Gray, ⁵⁰⁶ Apr. 15 and Cheatham. ²²⁴ May 20. Garel had observed twenty-nine cases, and was of the opinion that a catarrhal condition of the pharyngo-nasal mucous membrane was an important factor in its development. Wingrave noticed, on the contrary, that the lepto-thrix seemed to prefer healthy surfaces, adhering tenaciously in clusters to the epithelium, and persistently growing after removal. Kraus states that it tends to penetrate the deep layers of the membrane proper, including its glands and follicles. Labit's case was remarkable owing to the extent of involvement, the entire pharyngeal cavity, the base of the tongue, and the upper part of the larynx being included in the process. All the authors quoted considered galvano-cautery as the most effective measure.

Buchanan, ²¹³ Aug. basing his opinion upon the fact that the organism will not stain with iodine in alkaline solution, while it will in iodine in acid solution, suggests that a preparation in the latter form might prove advantageous. Wagnier, of Lille, ¹¹ June employed anhydrous chromic acid fused on a probe in two cases, touching the mycotic points lightly two or three times at a week's interval. Both cases were rapidly cured. Moure, of Bordeaux, ¹¹ June had obtained the best results from iodo-iodated zinc solution, as recommended by Nabias and Sabrazès last year. ²¹⁴ Feb. 1, '92 Ruault and Colin, of Paris, ²¹² May 10 noticed that tobacco seemed to benefit the

affection; they remove the mycotic vegetations and apply a solution composed of iodine 2 grammes (30 grains), iodide of potassium 3 grammes (45 grains), and water 20 grammes (5 drachms) to the spots to prevent recurrence.

Cheatham²²⁴_{May 20} advises systematic inspection of the teeth, the nidus of the pathogenic parasite.

Rheumatic Pharyngitis.—Under the name of “acute rheumatismal pharyngomyositis,” Mercantino, of Turin,⁹⁹⁷_{Dec. 8, '92; Jan. 25}⁹⁹⁶ describes an affection which, though rather common, is seldom noticed in text-books. The patients suffer great pain in deglutition, and yet close examination shows nothing, or at least but a slight redness. The author, like most physicians, regarded such cases as simple catarrhal anginas, until, working in a poorly-closed laboratory, he was one day affected with pharyngeal pain, which increased to such an extent as to prevent sleep and the taking of food. Local examination was negative; there were no general phenomena, and no fever. Two similar cases presented themselves in his practice, one accompanied by cervical myalgia. This fact, combined with the rapid recovery, led to the diagnosis of pharyngeal rheumatic myositis. The affection is characterized by acute pain on pressure and deglutition following a chill, the pharynx being normal or but slightly reddened, with slight or no fever, and rapid cure by antirheumatics, massage, and hot applications.

The classical form of rheumatic throat affections is ably described by Max Thorner, of Cincinnati,⁵⁴⁶_{Mar.} and G. L. Romine, of Lambertville, N. J.⁷⁸⁷_{Apr.}

Malarial Pharyngitis.—L. Piazza,⁶²¹_{Dec. '92; June}⁶⁷³ according to the views of Mackenzie and Massei, admits the probability of a periodic and intermitting pharyngitis as one of the various sequelæ of infectious diseases, but believes that the periodic angina, as described by Peter and Desnos, is a pharyngeal neuralgia followed by an hyperæmic condition. In support of his views, the author relates the history of a periodic pharyngitis occurring during a fever, which, according to some authors, may be considered as due to the co-existence of the typhus bacillus with the plasmodium malariæ. The sore throat shows well-marked intermissions. (Report of Corr. Editor Massei, Naples.)

Erysipelas of the Pharynx.—Having given a brief account of the symptoms of erysipelas localized in the pharynx, G. Bäärn-

hielm²¹⁷¹ ⁶⁷³_{p.488, '92; Sept.} relates the history of five cases treated in the University Hospital at Upsala. Two were complicated with slight diphtheria and two were fatal. In three cases the diagnosis was verified by bacteriological examination (*streptococcus*). The disease was communicated to two female patients by the physician, who was treating another patient having erysipelas; the author therefore emphasizes its great contagiousness and also its danger, since the prognosis must be considered as very doubtful in all the various forms. As regards the treatment, Bäärnhielm, following the example of C. Bernabei, advises compresses of ice around the throat and painting with a solution of cocaine. (Report of Corr. Editor Eklund, Stockholm.)

Scrofulous Ulcers.—Hajek, of Vienna,⁵⁷ ¹²¹_{No. 83, '92; Sept.} states that there are sometimes observed, upon the posterior wall of the pharynx, the pillars of the fauces, and the soft palate, ulcers the origin of which is obscure. They are not lupous, syphilitic, or tuberculous, and appear under the form of soft granulations, which subsequently ulcerate. The ulceration may be very extensive; may cause the destruction of the pillars and the greater portion of the soft palate. The progress is always slow and may continue through several years. There is no constitutional reaction, and the ulcers are nearly or quite painless on contact. There are, generally, no other symptoms than those of scrofula. Hereditary syphilis does not appear to be present in any of the cases, though in a few it could not be absolutely excluded. Histological and bacteriological examination was negative as regards tuberculosis. The ulcers are very similar to those of tertiary syphilis, but their progress is much slower. While iodide of potassium is of no avail, mercury accelerates ulceration. In the writer's cases there was no marked cachexia. Scraping the granulations and applications of lactic acid determined a tendency to rapid cicatrization. The scars were firm, and of a glistening appearance, precisely similar to those of syphilitic gummatæ. The pillars and the soft palate may form adhesions to the posterior wall and partially occlude the cavity. Relapses are frequent, but are always cured by the local means indicated, together with a general tonic treatment. After complete cicatrization it is generally impossible to determine whether the disease has been syphilis or scrofula. It may be that some of the ulcers described are scrofulous with a syphilitic origin, but the

author is of the opinion that many ulcers attributed to syphilis are purely scrofulous.

Tuberculous Pharyngitis.—Cases of this affection are reported by Percy Kidd, of London²; Heryng, of Warsaw⁵²⁰; and J. E. Boylan, of Cincinnati.⁶¹ The first two authors obtained cicatrization by the local application of lactic acid. Heryng used an 80-per-cent. solution and then brushed the spot with a 1-per-cent. solution of pyoktanin; Kidd began with the 50-per-cent. solution and finally used the pure acid. He had seen four cases thus successfully treated, but was ever careful not to affirm that the patient was cured, though vastly improved. Boylan's case died within four months from the time the condition first made itself felt in the pharynx.

Syphilitic Pharyngitis.—Garel, of Lyons,²¹¹ after studying a large number of cases, came to the conclusion that an almost positive diagnosis could be established when dysphagia especially localized on the level of the tonsils and the posterior wall of the pharynx had existed over three weeks. The rule, however, he does not pretend to consider as absolute, but reference to his carefully-kept data renders the proportion of exceptions so limited as to almost permit of exclusion. A series of interesting cases is given by Cartaz, of Paris.¹¹

Rapid results may be obtained in cases presenting elements of danger to life, œdema, etc., according to Irsal, of Budapest,⁸⁸ by intra-muscular (gluteal region) injections of a 5-per-cent. (*sic*) solution of corrosive sublimate, the solution being prepared as follows: corrosive sublimate, chlorate of sodium, aa 0.5 gramme ($7\frac{1}{2}$ grains); distilled water, 10 grammes ($2\frac{1}{2}$ drachms); a Pravaz syringeful being administered at each injection. In two typical cases detailed the injections were renewed each week, one requiring nine injections, the other seven.

Acute Infectious Phlegmon.—Dudefoy,²⁰¹² after reviewing the labors of Merklen, Senator, and Massei, gives a good description of this rather rare disease. Suddenly beginning with severe pain in the pharynx, intense dysphagia and permanent dyspnoea soon supervene, caused by laryngeal obstruction from œdematosus and inflammatory swelling of the aryepiglottic folds, the arytenoids, and the laryngeal mucous membrane itself. A characteristic sign is pain upon pressing the thyroid cartilage; from

the first there is evidence of profound infection, fever, delirium, constant excitement, and considerable albuminuria. Death has occurred in several cases, suddenly, from cardio-bulbar inhibition in spite of tracheotomy. Of 19 cases collected, recovery is recorded in only 5.

In a case reported by S. Kohn⁵⁰ _{Mar. 4} the affection occurred as a complication of follicular tonsillitis, and death ensued in seventy-two hours. A study of the case, however, would hardly warrant its classification as one of true infectious phlegmon. A. Dubler,²⁰ _{B. 126, II, 8} after careful examination—bacteriological and microscopical—of tricuspid efflorescences and spleen-blood in two cases, found and cultivated a streptococcus resembling in every particular the erysipelas coccus of Febleisen. He disagrees with Senator regarding the production of the disease through other lesions of the pharynx.

Retropharyngeal Abscess.—In a communication on the diagnosis and treatment of idiopathic retropharyngeal abscess in children, F. Massei, of Naples,⁴⁶¹ _{Apr.} demonstrated how frequently this form of abscess may be mistaken for other disorders, such as retropharyngeal sarcoma, coryza, tonsillitis, croup, typhoid fever, diphtheria, etc. He considers this is due to the presence of symptoms common to both nose and larynx, according to the location of the abscess—whether in the upper or lower pharynx—or the prevalence of constitutional signs which, to a degree, suppress the local symptoms. Hence the importance of careful examination, in which the finger for exploration *in situ* is to play an important part. His observations are based upon forty cases. A case is described by J. Dunn,⁸¹ _{May} in which the abscess was multiple, showing three areas of fluctuation.

Phocas³ _{Dec. 24, '92; Jan. 28},² advocates the treatment of retropharyngeal abscess by incision through the skin, and not through the mouth; this method, which he points out has been adopted by Watson Cheyne and Pollard, is preferable for several reasons. He quotes cases to show the danger of wounding the carotid which may be displaced by the abscess, and the possibility of immediate asphyxia from aspiration of pus into the lungs, or of broncho-pneumonia at a later date owing to the same accident. As to the site of the cutaneous incision, he recommends that posterior to the sternomastoid, and does not use the scalpel after the cutaneous structures

have been divided. In one case which he records he washed out the abscess-cavity, and recovery was rapid. The operation by incision through the skin has the further advantage that there is no difficulty or danger in giving chloroform. Reverdin, of Geneva,¹⁹⁷ Nov. 30, '92 greatly favors this procedure. In a case of retropharyngeal abscess, due to Pott's disease, he was able to not only evacuate the abscess with great ease, but also to carefully examine the cavity, remove sequestra, and curette the pyogenic surfaces. Tamponing with iodoform gauze aided drainage and brought about a complete cure. Branthomme, of Ecouen,³ Mar. 8 combats the reasons given in support of the external operation. The internal operation, he rightly says, is much more within the scope of the general practitioner, and the pretended exposure of the carotid through crowding by the abscess he considers as a weak argument, the large vessels being thus only exposed by external pressure, such as that caused by cervical adeno-phlegmons. Secondary septicaemia—another reason adduced—he considers as purely theoretical, while the suffocation to be feared during the oral operation can always be averted by rapidly inclining the patient's head forward the moment the incision is made. In a fatal case of unrecognized abscess, in a girl of 7½ years, reported by Campbell, of Tübingen,³²³ H. 2 autopsy revealed cryptogenetic septicopyæmia. The abscess was very small and located close to the cervical plexus, and pressure upon this gave rise to evanescent and misleading symptoms. Davidson⁶ Oct. 15, '92 reports a case in which laryngotomy and prolonged artificial respiration alone saved the patient.

Foreign Bodies in the Pharynx.—Downie²¹³ Jan. strongly urges operation in all cases where the inversion method has failed to dislodge the body. A boy, aged 9, while eating hazel-nuts, inhaled a portion of one. His father gave him an emetic, after taking which the boy breathed more freely. Three days afterward Adams and Downie recommended an early operation. Tracheotomy on the fourth day, under chloroform, relieved the boy of a quantity of pus and the kernel of nut. The position taken by Downie was discussed before the Glasgow Medico-Chirurgical Society, when Knox reported a case that went on without an operation for twelve days, although a horse-bean had entered the windpipe. This case was a thorough test of the power of emetics and the natural expulsive power of coughing, but finally required tracheotomy.

Membranous Sore Throat.—Barbier ⁴⁵_{V.4, No. 6; July 15} ¹²⁶ described a streptococcus found by him in this disease. The microbe forms in serum in twenty-four hours, in small colonies, plainly visible under the microscope, and growing the following days in patches, having the appearance of being varnished. After several days they consolidate into a brilliant and transparent whole. The microbe grows well on glycerin-gelose, gives but a thin culture with potato, and in bouillon thin masses easily separated. It coagulates milk in five days, and its vitality is conserved for twenty days. In solid media it has the aspect of an immobile diplococcus, non-capsulated, and in bouillon of small chains of diplococci. It is almost entirely decolorized by Gram's method. It is pathogenic for the rabbit, but not for guinea-pigs or mice ; it produces false membrane upon the bucco-pharyngeal mucous membrane of the pigeon. In man, whether associated with the Loeffler bacillus or not, it does not correspond to grave or infectious diphtherias.

TONSILS.

Tonsillitis.—Lennox Browne, of London, ^{11 Aug.; 99 Dec. 7}, basing his opinion upon hospital records, that the epidemic wave of acute tonsillitis is greatest when the first rain falls, being but slight, after a lengthened period of dry weather, are sufficient to stimulate to activity the dry and comparatively inert organic matter, and it only passes away with the thorough flushing of the sewers after heavier rain. Although dust plays a part in the production of throat diseases, long-continued drought and heat only become seriously noxious factors on occurrence of a change. C. MacLachlan, of New Rockford, N. D., ^{105 June} quotes ten cases to support his opinion that there is a specific contagium which, finding a favorable nidus for development and procreation in an idiopathic case, may be transmitted by contagion to other members of the same household. The stage of incubation is about seven days, and the course of an uncomplicated case is from five to seven days.

Richardière, of Paris, ^{17 Jan. 20} in a study of the pleuro-pulmonary complications of tonsillitis, comes to the conclusion that divers courses may be taken by the pathogenic elements. At times the pulmonary disorder becomes developed by propagation of the inflammatory process along the cellular tissue of the mediastinum and pleura ; at others it becomes manifest without apparent inter-

mediate course, constituting in that case pure visceral localization of the infectious process. Sacaze, of Montpellier,^{July 9}¹⁴, relates an interesting case of arthritic complication, the infectious process, in his opinion, having been transmitted from the affected tonsil. A point of special interest in the case is the fact that the affected wrist had previously been the seat of a traumatism, thus giving rise to diminished local resistance.

To aid in the recognition of rheumatic cases the following data are suggested by S. Solis-Cohen, of Philadelphia^{Aug.}⁴⁵¹: 1. History of previous rheumatism or an inherited rheumatic tendency. 2. A tendency to frequent recurrence of the affection. 3. The occurrence of symptoms, local or general, before any evidence of inflammation is visible in the throat. 4. The coincidence of one or more rheumatic or rheumatoid symptoms with sore throat. 5. The existence of any joint-symptoms. 6. Urinalysis, excessive acidity, excess of urates, etc.; rarely albuminuria. 7. The occurrence of anomalous eruptions. Mules, of Manchester,^{May}¹¹, also presents a paper on tonsillitis in its relation to rheumatism.

A case of convulsions due to tonsillitis, in a child aged 18 months, is related by M. J. Donahue, of Waterbury, Conn.^{May}¹¹². Death from rupture of a tonsillar abscess into the larynx occurred in a case upon which T. Gann, of The Cayo, Honduras,^{June 24}⁶, was about to operate.

J. E. Newcomb, of New York,^{Dec. 10, '92}⁶¹, contributes a comparative study based on 169 cases. He divides these cases into three groups according as treatment was begun on the first or second day of the disease, on the third day, or after the third day. Salol was employed in 5-grain (0.32 gramme) doses in mucilaginous suspension. The cases are tabulated and the number of hours given before relief from pain was felt. Thirty-six cases in which salol was given belonged to the first group, and the average number of hours before relief was felt was twelve. In 6 cases there was no relief. Fifteen cases belonged to the second group. The average number of hours before relief was fourteen; failures, three. Thirty cases were in the third group, with four failures. Average number of hours before relief, eighteen. In no case was any unpleasant effect from salol observed. The urine was always dark, suggesting carboluria. Guaiac was the second remedy tried. Twenty cases were in the first group, with two failures. Average

number of hours before relief, eighteen. There were two failures in the 10 cases of the second group, and the average number of hours before relief was twenty-three and one-half. Among the 14 cases in the third group there were four failures. Average number of hours before relief was eleven. Guaiac has the disadvantage of being extremely disagreeable to take. Salicylate of sodium was given in 5-grain (0.32 gramme) doses in solution every two hours. In 15 cases in the first group there were two failures. Average number of hours before relief was twenty-four. In the second group there were 12 cases (two failures), and average number of hours before relief seventeen. In the third group there were 17 cases (six failures). Eighty-one cases (48 per cent.) treated by salol, relief on an average in fourteen and one-third hours. Forty-four cases (26 per cent.) treated by guaiac, relief on an average in seventeen and one-third hours. Forty-four cases (26 per cent.) treated by salicylate of sodium, relief on an average in eighteen and one-half hours. Newcomb believes that in many cases a previous rheumatic history is simply a coincidence, as relief was obtained, in practically the same number of hours, whether there was or was not a previous rheumatic history. Salol, in the majority of cases, will give relief quicker than any other remedy.

Von Ziemssen, of Munich,¹⁵¹ highly recommends parenchymatous injections. Many persons affected with hypertrophied tonsils are exposed, from time to time, to parenchymatous inflammations of these organs. In most cases these exacerbations are brought about by plugs forming in the lacunæ of the tonsils and inducing their arctation. Through the infection of these plugs inflammation is induced. According to von Ziemssen, injections of 2-per-cent. carbolic-acid solution into the tonsillar tissue have proved the most efficient remedy against these inflammations; 2 to 3 cubic centimetres of this solution are emitted into the tonsil. The action of these injections is highly beneficial and rapid, the greatly-disturbed general health being materially improved after an hour, in many cases. A young colleague who subjected himself to an accurate observation has supplied interesting data on the surprising improvement of general condition soon after injection. Sahli (Berne), in the course of the discussion, confirmed the favorable effects of tonsillar injection; he uses 3-per-cent. iodine trichloride solutions instead of carbolic acid. The method is also

recommended by R. W. Raudnitz.⁸⁸ Heubner, of Leipzig,^{June 15}_{No. 19} who has applied parenchymatous injections of carbolic acid for many years, praises especially the results obtained in scarlatinal diphtheria. The operation in itself is by no means painful; in one case where cure was obtained, thirty-five injections had been performed. Applewhite, of Corvallis, O.,¹⁸⁶_{May} employed with marked advantage the plan recommended by Hunter Maguire, of Richmond,—application of iodine by cataphoresis. J. C. Hoag, of Chicago,²⁵⁷_{June} carefully removes the exudate and makes a local application of peroxide of hydrogen, which he directs the patient to continue. His personal application, if thoroughly executed, frequently brings on marked improvement within a few hours. Internal medication is not precluded. The application of a solution of chloride of zinc in glycerin (1 to 20) at the start is recommended, by an anonymous writer,²²_{Mar. 1} as an abortive, with salol, 20 grains (1.3 grammes) three times a day, as a germicide.

Ruault, of Paris,⁸²⁷_{Jan. 17} recommends that the abscess-cavity be opened between the anterior pillar and the tonsil opposite the upper part of the latter, the natural evacuation taking place in this location. The operation is thus facilitated and the pain reduced.

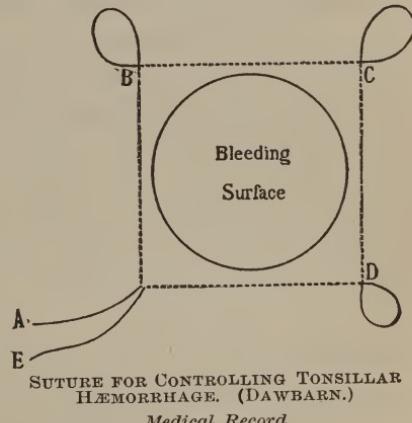
Hypertrophy of the Tonsils.—Ruault, of Paris,¹⁷_{Jan.; July}¹¹² claims that his method of removing hypertrophied tonsils is superior to both the tonsillotome and ignipuncture in cases where such methods are usually employed. It does not cause bleeding, like the former; nor pain, either immediate or consecutive, as does the latter. It enables one to operate with a precision and surety lacking in other methods. Cocaine having been applied to the tonsil, any crypts containing concretions are cleaned out, and such adhesions as may exist between the tonsil and soft palate broken with a curved probe. By means of a cutting-forceps, one blade of which is flat and fits into the opposite one, which has a sharp cutting-edge, small pieces of the projecting tonsil are then removed. After several pieces have been cut off, the raw surface is energetically rubbed with a swab of cotton moistened with iodine (1 part), iodide of potassium (1 part), and water (6 to 8 parts). The discomfort arising from this passes off in a quarter- or half-hour. In a few days secondary retraction will have reduced the size of the remainder of the tonsil, and, if necessary, any projecting pieces

may be removed as before. Of eighty cases treated by the author, in only three was there a necessity for operating a third time, except in the case of infants. L. Malley²⁰¹² slaughters all other methods in favor of Ruault's.

In an analysis of two hundred and thirty cases, ranging in age from 2 to 50 years, operated upon, G. Hunter Mackenzie, of Edinburgh,^{Mar. 25} never had to contend with profuse or troublesome haemorrhage, and he believes that the danger from this source is very slight, if care be taken to leave an evenly-cut surface.

Heryng, of Warsaw,^{520 Nov. 41 to 53} draws attention to the erroneous view concerning the possibility of wounding the internal carotid artery, which is situated in the pharyngo-maxillary space, and, therefore, not within the range of an instrument cutting antero-posteriorly.

E. Jessop^{2 June 8} relates a case of secondary haemorrhage after removal of the tonsils of a delicate girl, 10 years of age, with a Mackenzie tonsillotome. When he arrived "the child was utterly blanched, almost pulseless, and evidently in a very serious condition. Before looking at the throat, I had to give brandy, raise the legs, lower the head, and put hot bottles in the bed to bring her around." Ice-sucking stopped the bleeding for awhile, but it did not permanently cease until the tonsil had been "scrubbed with dry wool on a holder," and then with perchloride of iron. As the haemorrhage occurred four days after the operation, Jessop attributes it to "the slough coming away from an unhealthy wound." Dawbarn, of New York,^{59 Dec. 17, '92} suggests a new method of checking bleeding after tonsillotomy, which consists in surrounding the bleeding surface with a stout purse-string ligature of silk or catgut, which, when tightened, is entirely hidden in the tissues about the tonsillar stump. The mouth being held open by means of a cork, a large needle, held in a long needle-holder, is used to pass four stitches, as shown in the cut, beginning below and transversely. When the free ends (*A* and *E*) are drawn up,



SUTURE FOR CONTROLLING TONSILLAR
HAEMORRHAGE. (DAWBARN.)

Medical Record.

the loops (*B*, *C*, and *D*), of course, disappear. The ligature is now tied tightly enough to stop bleeding. The thread may either be left to slough out or, and probably preferably, may be cut and removed in twenty-four to thirty-six hours.

A new instrument for controlling tonsillar hæmorrhage is contributed by H. Hoyle Butts. ⁵⁹_{July 1} Sendziak, of Warsaw, ¹³⁶_{Feb. 18} employs the best weapon against tonsillar hæmorrhage,—prudence. He therefore gives preference to galvano-cautery, especially in the adult.

Syphilis.—R. Gaube, of Lyons, ⁵⁷⁷_{Feb.} and Marsh ²_{Feb. 4} report each a case of primary syphilitic sore located on the tonsil. The latter observer's case was that of a woman, aged 48, whose throat had felt irritable for five weeks, and sore for some days. On the upper aspect of the left tonsil there was a circular sore the size of a shilling, the base of which was hard and indurated, and the surface excoriated and superficially ulcerated on the posterior margin. A group of glands in the parotid region were enlarged and hard. Afterward a copious secondary eruption, chiefly roseola, appeared on the body and limbs. Both the primary and secondary lesions rapidly disappeared under mercurial treatment. De Havilland Hall ¹¹_{June} relates a case in which the mitral lesions had occurred twenty-five years before. L. Duncan Bulkley ²²_{Sept. 20} quotes the authority of Boeck to the effect that in Norway chancres occur oftener in this location than in any other after the genitals. This he considers due to the habit of various members of a family using the same materials in eating and drinking. The tonsils are quite frequently attacked because they are so apt to be affected by inflammatory conditions. The act of deglutition is also favorable to the development of chancrous deposition. In Boeck's practice they constituted 14 per cent. of all his cases of extra-genital chancre. He thinks chancres are very apt to be overlooked in this region, and states that in twelve of his cases the chancre was innocently acquired. The characteristic features of the affection are enlargement of the tonsils, extreme hardness, superficial ulceration marked by sharply-defined edges, and enlargement of the lymphoid glands. The first thing noticed by the patient is a stinging pain in the tonsils, and more or less dysphagia.

Tumors.—A case of sarcoma is described by Lermoyez, of Paris, ³⁷_{Apr.} from which he draws the opinion that, as far as tonsillar

tumors are concerned, a diagnosis can only be made with the assistance of the microscope, the examination being repeated several times if the clinical indications vary with its showings. J. Dunn, of Richmond, ^{Aug. 19} also reports a case in detail.

Of especial interest is a case described by Norris Wolfenden, of London.¹¹ This case first came under his care in June, 1889. The tonsil was extirpated as completely as possible with the galvano-cautery snare. Examination of the growth proved it to be a small round-celled sarcoma. Two years later, in 1891, she came a second time complaining of a recurrence of the growth. Twelve months after the operation she said the tonsil had begun to grow again. The pain was not very severe, but was worse on swallowing. The tonsil was smooth, hard, and of a dusky color. The glands at the angle of the jaw were slightly enlarged. On July 3d she had several attacks of fainting, and her condition seemed critical. On July 30th the upper part of the tonsil was removed with the cold-wire snare with very little loss of blood, and she was soon able to return home. He did not think she would live more than a few months, but to his surprise he heard this summer that she was quite well; better, in fact, than she had ever been in her life; though it is now four years since she first came under treatment.

The case is interesting inasmuch as it is very rare to find patients with sarcoma of the tonsil surviving more than a year the operation or after the recognition of the disease. It seemed to him particularly desirable that practitioners should be careful to furnish the subsequent history of their cases, with special reference to whether the operation was undertaken by the mouth or otherwise. Macintyre ^{Aug.} relates another successful case. A fatal case of *lymphosarcoma* is reported by Aunis, of Bordeaux.^{188 Feb. 5}

Macintyre, in the paper quoted above,¹¹ also describes a case of primary *epithelioma* of the tonsil which had suffered no recurrence, although the operation had been performed about twenty months before. The faucial pillar was involved with the tonsil. T. F. Chavasse ^{June 10}⁶ describes three cases in which he resorted to pharyngotomy. One of the cases was in good health fifteen months after the operation, the other two having died. A case of *scirrhous* cancer is related by Onodi, of Budapest,^{136 Sept. 15} in which, however, the weakness of the patient precluded operative procedures.

An instructive study of the influence of lactic acid in *sarcoma* is contributed by E. Fletcher Ingals, of Chicago.¹ The tonsil and a portion of the uvula were removed. A month later the wound had healed except at one spot, but new deposits had taken place at the site of the tonsil. A 60-per-cent. solution of acid was applied to the ulcer, this causing prompt healing. A swelling of the right posterior pillar having appeared, an injection of 5 minims (0.32 cubic centimetre) of 20-per-cent. solution of lactic acid was made into the mass. Profuse bleeding followed the introduction of the needle; the haemorrhage decreased as treatment progressed. The strength of the solution was increased to 60 per cent. This proved too strong and caused sloughing, the abscesses so formed, however, always healing kindly. It was found most advantageous to use 60-per-cent. solution, injecting 10 minims (0.65 cubic centimetre) in one or two places three times a week. This treatment was followed by steady diminution in size of the enlargement at the site of the tonsils, but the cancer extended to the base of the tongue, the pharynx, and the side of the larynx, causing great dysphagia. Injections were made into the tissues newly involved, and in each instance caused the disappearance of a mass of tissue eight to ten millimetres in diameter. No sloughs formed when 50-per-cent. solution was used. The injections caused pain lasting several hours. When the tongue and pharynx became involved, they rapidly reduced them to their normal conditions. The patient's general health and strength remained as good as they had been ten months before, but the disease was gradually extending beyond reach of local treatment at the time the report was made. The injections—made with an ordinary hypodermatic syringe, having a needle four inches long—were followed by an anodyne and astringent spray.

C. Biaggi¹¹³¹ describes at length a case of *lipoma*.

Chronic Encysted Abscess.—Peyrissac²¹⁷² has been able to collect only a small number of cases of this affection from literature, but believes it to be more frequent than is supposed, and to result from a previous amygdalitis, dating, perhaps, some years back. It simulates cold abscess, and is accompanied by no general symptoms, febrile or infectious. There is merely a sense of discomfort in the throat, sometimes slight cough; sometimes the abscess is only revealed by the intermittent expectoration of pus

when the sac is filled. The contents are sometimes granular or syrupy, or butyraceous as in a sebaceous cyst. The chronic and recurrent nature of the abscess depends partly on the obstruction of its orifice by the direction of the fistulous track toward the pillars.

LINGUAL TONSIL.

Hæmorrhage.—Joal, of Paris, ¹⁸⁶_{June 1} publishes three cases of haemorrhage of the lingual tonsil in healthy patients, which might have been taken for cases of hæmoptysis. Close examination of the chest proved that there could be no suspicion of tuberculosis, although the cough and general symptoms would lead to such a diagnosis. Laryngological examination showed that the blood came from a rupture of the capillary vessels of a hypertrophied lingual tonsil.

Syphilis.—F. Schiffers, of Liége, ²⁸⁶_{No. 30} states that the primary symptom of syphilis is often unperceived and leaves no trace. In the great majority of cases these lesions are observed about the natural orifices,—the genito-anal and bucco-pharyngeal regions. Schiffers describes an interesting case, that of a painter, 27 years old, who showed a primary lesion of the lingual tonsil, at the left of the base of the tongue. Excessive pain in deglutition could only be explained by this ulceration, five to six millimetres in diameter. There was indolent swelling of the glands on the same side. The mode of contagion was unknown. Without direct examination, the ulceration would probably have healed, and the primary lesion would thus never have been known.

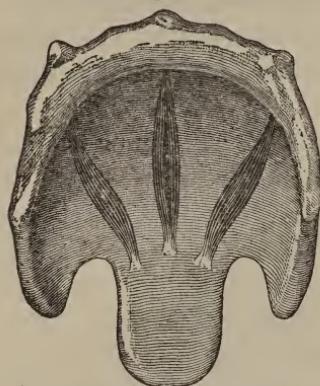
Seifert ³⁴_{Feb.} also concludes, from a study of seventy-one cases of syphilis, that in the majority of cases of this disease, in which the throat and especially the tonsils show lesions, the lingual tonsil takes part in the process, and that syphilis in this region is therefore not rare.

LARYNX.

Anatomy and Physiology.—John Macintyre, of Glasgow, ²¹⁷³ describes four muscles—two median and two lateral—of the larynx not considered in text-books. The first two—the median—are each seven-eighths of an inch in length, and appear as a slender, flattened band arising from the posterior surface of the body of the hyoid bone near the middle line. Passing backward and slightly downward, they are inserted into the anterior surface

of the base of the epiglottis, where they spread out a little so as to touch the lateral pair in their insertion. The latter rise half an inch external to the former, from the great cornua of the bone and thyro-hyoid membrane, measure one inch in length, and are flattened from side to side. Passing backward, inward, and slightly downward, they are inserted by an expansion of the tendon into the anterior surface of the epiglottis near the preceding pair. The muscles lie in a mass of adipose tissue, covered with the mucous membrane passing between the tongue and the epiglottis. Thirty-seven specimens of the human larynx have since been dissected, but in no instance, as yet seen, are they defined as in the specimen shown.

Katzenstein, of Berlin,^{20th, 11th} says that by electric stimulation of the nervus pharyngeus medius e vago no contraction of the crico-thyroid muscle is produced. The stimulation of this nerve only produces a contraction of the pharyngeal muscles of the same side, and the oesophagus in its upper part. The section of the nervus laryngeus superior is only followed by partial, not by complete, atrophy of the crico-thyroid muscle of the same side.



HYO-EPIGLOTTIDEAN MUSCLES.
(MACINTYRE.)

Monograph.

The section of the nervus pharyngeus medius e vago is followed by partial atrophy of the pharyngeal musculature of the same side, but the crico-thyroid muscle of this side is not influenced. If the nerves of both sides are resected, death soon follows. Extirpation of laryngeal nerves is followed by atrophy of the muscles. The author concludes that no nervus laryngeus medius exists.

Onodi, of Budapest,^{11th} from numerous researches on the function of the crico-thyroid muscle, concludes : (1) section of both inferior laryngeal nerves does not determine a median position of the cords when the trachea is open ; (2) the median position is obtained when the trachea is closed ; (3) the median position only lasts a short time, and is not permanent ; (4) the median position can be produced for some minutes in a reflex manner by acting on the nerves of the skin.

As a sequel to experiments conducted in 1890, Masini, of

Genoa,⁶²⁴ July contributes an important paper upon the physiology of the recurrent nerve. As is well known, Burkhardt had caused the arrest of the diaphragm in respiration, by electric excitation of the central portion of the nerve. Krause, on his side, caused a movement of deglutition by slight excitation, and a contraction of the vocal cord on the opposite side to the sectioned nerve by a little stronger excitation; by prolonging this he obtained movements more closely following each other, and finally complete adduction of the cord which appeared contracted. Experiments made by Masini upon dogs, the larynx being examined by assistants ignorant of the aim of the experiment, gave identical results. The contraction of the cord is evidently of reflex origin, and the result of the presence of centripetal fibres in the recurrent nerve.

To approach the conditions existing in cases of goitre and aneurism, Masini endeavored to produce gradual and slow compression of the recurrent nerve by means of a bean which he perforated, introducing the nerve into it and closing the perforation. When the bean began to swell and to compress the nerve,—that is, at the end of two or three days,—the same symptoms were observed, the cords and arytenoids taking exactly the same position as in compressions of a pathological nature. Masini made control observations upon a patient in whom one of the thyroid lobes was calcified, and who suffered from attacks of suffocation due to exaggerated adduction of the vocal cords. By titillating the base of the throat and moving the head of the patient attacks of spasm were induced, in which contraction of the cord on the opposite side to the compressed recurrent nerve played the principal rôle. Removal of the goitre caused the disappearance of the attacks.

Laryngitis.—Mulhall, of St. Louis, ⁸² June 17 terms “laryngitis hemicallis”—winter laryngitis—a variety of subacute laryngitis in which the secretions are rapidly changed into adhesive crusts. Cold weather is the important factor in its production. There is complete aphonia. The crusts often cling to the surfaces of the true bands and the arytenoids. The evidences of inflammation in the larynx are slight. The condition differs from laryngitis sicca, which it closely resembles, however. Improvement rapidly follows removal of the crusts and the use of a spray containing vaselin and eucalyptol. A case in which the condition present corresponded in many ways with the above is reported by Kuh, of Chicago, ⁶¹ Apr. 16

but extending to the trachea, the green secretion almost occluding its lumen and causing marked stridor. The administration of what he calls the "deep spray," causing the patient to inhale deeply while the fluid is atomized in the cavity, efficiently influenced the inflammatory process and brought about recovery. Brockbank, of Birmingham, ^{June 24}² in nine cases of acute laryngitis sufficiently grave to cause dyspnœic recession of the chest during inspiration, found that the pulse invariably became small during the same period. As the disease progressed the symptom became more and more marked until, just before tracheotomy was done in the cases requiring it, the pulse was found to be almost imperceptible during inspiration. The moment the trachea was opened and air allowed to freely enter the chest the pulse resumed its regularity in volume and rhythm. Tracings are shown illustrating the point.

Cartaz ¹¹_{June} states that laryngeal manifestations of influenza are frequent. Generally there is simply a catarrhal inflammation without gravity, but serious complications may occur,—ulcers, erosions, paralyses, œdema. The latter is fortunately exceptional; the author has, however, seen two cases in the Necker Hospital. The œdema affected the arytenoids and ventricular bands, and dyspnœa was marked, but not so great as to necessitate tracheotomy. Natier had seen two cases of influenza complicated with laryngeal œdema of the cords, which disappeared upon applications of nitrate of silver. S. H. Chapman, of New Haven, ¹_{Dec. 10, '92}, after reporting a number of cases, concludes: 1. That disease of the upper air-passages is not uncommon coincidently with attacks of influenza. 2. That the usual form is a sanguineo-purulent inflammation of the pharynx, frequently extending upward into the dome of the pharynx and nasal cavities, and downward into the larynx and trachea. 3. That other incidental forms of disease may occur, a contributing influence toward which may be discovered in the previous pathological condition of the subject, as, for example, a plastic form of inflammation in those of a rheumatic or gouty diathesis, a lymphangeal inflammation in subjects of renal disorder, and forms of neuralgias and paralysis in cases of disease of the nerves and spine. 4. A reduced instead of an accelerated pulse is so constant a symptom in cases of previous disease of the spine that it may be considered of some diagnostic

value in the detection of an unsuspected spinal disorder when occurring during an attack of *la grippe*. 5. The attacks of *la grippe* have such curious action in cases of previous spinal disorder, this action being illustrated by symptoms so closely allied to those of epidemic cerebro-spinal disease, that the subject of the connection between these two diseases is worthy of further investigation.

Lucatello⁵⁰⁵ reviews the laryngeal complications during the later stage of typhoid fever. Catarrhal laryngitis, œdema of the glottis, perichondritis, may all be seen. The last-mentioned lesion may give rise to most wide-spread results in the direction of stenosis, besides its immediate dangers from necrosis of the cartilages and the like. From the intense prostration and apathy of the later period of typhoid these may go for some time unnoticed and progress untreated. He has demonstrated the presence of the bacillus previously described by Eberth in the sputum, and also in sections of the mucous membrane of the larynx in a fatal case of typhoid, showing that the laryngeal lesion is of a specific character, and not due simply to the general effects of the fever. He insists upon the importance, in cases of typhoid in which there is any suspicion of laryngeal symptoms, of examination with the laryngoscope.

Tissier and Bellot⁷³³ describe a case of laryngo-typhus. Beginning with hoarseness due to acute laryngitis, with ulceration, dyspnœa soon follows, demanding tracheotomy. If the patient recover, the local disorder, perichondritis, crico-arytenoid ankylosis, etc., will likely cause the wearing of the cannula to become permanent.

Œdema.—Schmiegelow, of Copenhagen,^{1151; 451} reports two cases of œdema due to iodide of potassium. The first was a carcinoma of the larynx, in which an antisyphilitic treatment was instituted to eliminate the possibility of syphilis. After about 1 gramme (15½ grains) of iodide of potassium had been taken, laryngeal œdema developed to such an extent that tracheotomy was required. In the second case, which was thought to be syphilitic, the epiglottis, arytenoids, and ventricular bands were œdematosus, and the patient suffered from dyspnœa. On administering iodide of potassium for a day or two, the œdema and dyspnœa increased. On leaving off the iodide of potassium, the

œdema quickly improved in both cases. The remedy was administered later in the second case, without causing œdema. Four cases due to various causes are reported by J. W. Robertson, of Litchfield, Minn. ¹⁰⁵ _{Dec. 15, '92} Von Hajek ²²⁶ _{v. 42, No. 1} gives the results of some anatomical researches upon œdema of the larynx.

Laryngeal Abscess.—C. Poli, ⁵⁰⁵ _{Mar. 14, '92} ⁶⁷³ _{July} in a case of actinomycosis, the diagnosis of which was confirmed by microchemical examination of pus obtained from a perilaryngeal abscess present, accidentally observed the characteristic sulphur-yellow granulations found in these cases. The trouble had begun with sore throat; and stigmata, the remains of a former pharyngeal phlegmon, were observed. After the operation, the dyspnoic symptoms, which were due to laryngeal compression, disappeared, and recovery followed a vigorous antiseptic treatment. The case is of special importance when we consider that actinomycosis is comparatively rare in Italy. (Report of Corr. Editor Massei, Naples.)

Barbacci, of Florence, ³⁷⁶ _{v. 44, No. 14, '92} describes the case of a man of 28 years, who was suffering from his throat, and who suddenly died in a fit of dyspnoea. At the post-mortem three-quarters of the cricoid were found necrosed.

Gouguenheim ¹¹ _{Dec., '92} observed the case of an old woman, aged 60 years, who was brought into the Hôpital Lariboisière suffering from suffocation and aphonia. Tracheotomy was performed. A great deal of pus flowed, and the introduction of the cannula was not at first followed by restoration of the passage of air, but afterward respiration was re-established and the voice regained its tone. The next day, when the cannula was removed, a purulent collection was found to surround the larynx and trachea. A probe came upon exposed bone, deep down. Shortly after paralytic symptoms appeared, and the patient succumbed to medullary symptoms succeeding to the cervical disease. At the autopsy the sixth cervical vertebra was found to be tubercular, and formed a cavity full of sphacelated tissue, surrounding the trachea. The particular interest of this case is the direction taken by the pus, and the localization of the symptoms, which were sufficiently limited to lead to error and conduct the patient to the laryngologist. The affection had an absolutely abnormal course. The onset was most insidious, and the manner of its elimination most rare. Generally the pus burrows into the mediastinum.

Erysipelas of the Larynx.—A. Sokolowski⁵²⁰ gives a description of four cases of erysipelas of the larynx. The first ended successfully. It began as a lacunar inflammation of the throat, in which Stendter detected the presence of staphylococci and the cocci of erysipelas. It is possible that the process passed from the tonsils, by way of the lymphatic vessels, into the larynx, and occasioned the disease. In the second case post-mortem examination showed purulent infiltration of the larynx, from which probably ensued the general infection. In the last two cases, with mild course, the process began also on the tonsils, in the form of lacunar inflammation, and was followed by slight tumefaction of the larynx. The author is of opinion that this swelling was caused by the cocci of erysipelas, which fact could only be proved by bacteriological examination. (Report of Corr. Editor Drzewiecki, Warsaw.)

Lamter, of Konigsberg,⁴¹ Mar. 27 and J. Herzfeld¹³ Nov. 15 relate each a case of primary erysipelas of the larynx.

Hæmorrhage of the Larynx.—Poyet¹³⁶ Sept. 1 describes three interesting cases of submucous hæmorrhage of the vocal bands, two occurring in female opera-singers, in one several different times, under severe strain of the voice at the time of her menstruation. In neither of these cases was the voice permanently injured, returning gradually on the absorption of the clot, after several weeks of rest. The third case was that of a man evidently a sufferer from hæmophilia. Astringent applications alone were used. Nogavo⁴¹⁵ Sept. 23 reports a case that occurred in a man, 45 years of age, who had for some time been suffering from cirrhosis of the liver and cardiac disease. Dundas Grant¹¹ Aug. describes a case in which the apparent source of the bleeding was a vascular tumor of the vocal band. Removal of the growth caused the hæmorrhages to cease.

Eversion of the Ventricle.—B. Fraenkel, of Berlin,³⁷ Aug. microscopically examined a piece of prolapsed ventricle. The prolapsus appeared to involve the lateral portion of the ventricle, the portion of the vocal band in contact with the projecting ventricle appearing modified in structure. The muscular fasciculi of the thyroarytenoid muscles appeared atrophied, the connective tissue seeming to have become hypertrophied as well as the epithelium, the sum-total of the picture suggesting pachydermia.

In a case reported by W. F. Chappell, of New York, ⁵⁹ Jan. 7 intubation gave relief, but could not be kept up, and the everted ventricles were removed by means of a laryngeal guillotine of his own invention. Complete relief followed, although the patient died, six months later, of laryngeal cancer. Moure, of Bordeaux, ¹⁸⁸ June 4 and Beausoliel, also of Bordeaux, ¹¹ Oct., '92 report one case each. The latter's case was entirely relieved by local application of a chloride-of-zinc solution.

Rheumatism.—P. O. Bennett ¹⁰¹⁸ Jan. reports a case of ankylosis of the crico-arytenoid articulation, which had followed a rheumatic fever, during which he had experienced pain in the larynx and slight dyspnœa. There was no history of syphilis. The left cord was fixed, the posterior third being congested and swollen. Under iodide of potassium the latter symptoms disappeared, but the ankylosis remained. Compaired, of Madrid, ⁶²⁴ No. 1 reported two typical cases of acute crico-arytenoid arthritis, developed in connection with rheumatism. In the first case hoarseness, laryngeal pain (especially marked during phonation), and dysphagia developed about two hours after the general arthrodial symptoms. Examination of the larynx revealed tumefaction in the region of the arytenoid articulations, the parts being of a bright red. Adduction of the bands did not take place during efforts at phonation. Appropriate general and local measures soon brought about recovery. The symptoms in the second case were the same, and a cure resulted in nine days. He alludes to a third case seen anteriorly, but which at the time had not been recognized. Simonowski ²⁸⁶ Sept., Oct. described three similar cases, due to cold. In one case the dyspnœa became at one time menacing. The affection is interestingly described in a paper by Max Thorner, of Cincinnati. ⁵⁴⁶ Feb. 15

W. E. Casselberry, of Chicago, ¹¹ Nov. detailed the history of a woman, 58 years old, who suffered from laryngeal dyspnœa, marked inspiratory stridor, and some laryngitis. The vocal bands could not be abducted on account of an ankylosis of the arytenoid eminences. The patient had a general arthritis deformans, affecting the joints of the hands and feet, as well as the larger joints throughout the body. The attacks of laryngeal dyspnœa were self-limited, and corresponded with the exacerbations of the constitutional disease. During the course of the attack local treatment was employed to keep the larynx free from mucus, otherwise the

operation of tracheotomy could not have been avoided. Casselberry expressed himself in accord with the theory that arthritis deformans is a disease quite distinct from rheumatism, on the one hand, and gout, on the other hand, and that its laryngeal complications are entitled to a separate discussion. In the case reported the patient had been treated for a time on the supposition that the disease might be rheumatism or gout, but without any good effect.

Tuberculous Laryngitis.—An interesting point is brought out by Percy Kidd,²² _{Feb. 1, 19}, ⁴⁵¹ _{May} who states that the records of Brompton Hospital show that tubercular disease of the larynx is found in at least 50 per cent. of all patients dying of chronic pulmonary tuberculosis. Probably about 20 per cent. of patients suffering from phthisis manifest signs of tuberculosis of the larynx. The vocal cords and the posterior laryngeal wall, the parts most prone to become affected, are covered with non-ciliated epithelium, and it is here the sputum most usually adheres. The epiglottis is next in the order of frequency to be affected. The ventricular bands are less liable to be affected than any of the above parts. Of 100 consecutive autopsies in laryngeal tuberculosis, 23 showed the disease too wide-spread to be of use for comparison. Of the 77 remaining cases, the vocal cords were affected in 53 (68 per cent.), the posterior wall in 47 (61 per cent.), the epiglottis in 21 (27 per cent.), and the ventricular bands in 4 (5 per cent.).

Keller³⁴ _{Nov. 23 to 25, '92} describes the manifestations of tuberculosis in the posterior wall of the larynx. In examining the posterior laryngeal wall, he causes the patients to sit in an elevated position, and to bend the head far forward. He has thus examined 100 patients,—81 with evident pulmonary phthisis, 15 doubtful cases, 4 without phthisis; 48 had laryngeal phthisis, and, of these 48, lesions of the posterior wall were present in 34 cases. In 3 the nature of the lesions here could not be affirmed; in 8 of them the tuberculous process was confined to the posterior wall. The diagnosis rests between chronic catarrh of this region, pachydermia, syphilitic infiltration and gummatous, lupus, leprosy, scleroma, tumors,—among others, papillomata, in cases in which the tumor is not ulcerated; if it be ulcerated, it is to be distinguished from syphilis and catarrhal ulcerations. Examination for the bacilli or inoculation will remove all doubt.

Tuberculosis of the posterior laryngeal wall consists of two

stages, infiltration and ulceration. Infiltration is generally limited to the inter-arytenoid region, and in one of the author's cases was limited to the cricoid region. The second stage is always found in the inter-arytenoid region, due, the author thinks, to the mobility of the arytenoids and the folds caused in the mucous membrane during phonation. The progress of the disease is slow, but if the pulmonary affection is hastened it also progresses correspondingly. The ulcerations invading the anterior wall of the pharynx may be the cause of violent pain, while by rendering the arytenoids movable the infiltration may prevent their separation and cause asphyxia, necessitating tracheotomy.

W. McNeill Whistler¹¹ describes a case of chronic laryngeal tuberculosis. The case was shown at the 1881 International Congress, the laryngeal ulcerations having completely yielded to local medication; the swelling was so far reduced that a free view could be obtained into the trachea. For several years afterward the patient remained in fairly good health, taking codliver-oil and using creasote inhalations at intervals, and had now been steadily following his employment for nearly ten years. In April, 1892, symptoms of phthisis again began to appear, but soon subsided under treatment. He had now neither pain, cough, nor hoarseness. The laryngoscopic appearance at present showed a limited loss of substance of the epiglottis, the vocal cords thickened, the right cord being reddened. There was cicatricial thickening of the left ventricular band, and a narrow web springing from the vegetations on the inter-arytenoid fold extended to the right and attached to the posterior extremity of the right vocal bands. There was free movement of the bands, both in adduction and abduction. A case of tuberculosis of larynx and lungs terminating in epithelioma is recorded by Norris Wolfenden, of London.¹¹

F. Semon, of London, Mar. 11, July 11 strongly recommends constitutional treatment by creasote as a part of the remedial procedures to be adopted for the ulcerative lesions of tuberculous laryngitis, and narrates several good illustrative cases. The creasote must be perfectly pure, and is administered in 1-minim (0.065 gramme) capsules or pills thrice daily after meals, the number of capsules being gradually increased till 9, 12, or even 15 are taken daily. The lactic acid is applied in the usual strengths on absorbent wool, firmly wrapped around rectangular forceps, and is rubbed, with a

fair amount of force, into the floors of the ulcers. In cases where there is much oedema he allows this to subside, and prefers inhalations or insufflations of sedatives. Granulation tissue is scraped away, by means of Krause's or Heryng's laryngeal curette, previously to the application of the lactic acid. Dundas Grant,¹¹ in reviewing the above, states that it is surprising that the systematic creasote treatment of tuberculosis should have received so little notice in English medical periodicals compared with the prominence given to it in those appearing in France, Germany, and America, as our readers must have observed from numerous abstracts in this journal. He had used it both in private and hospital practice with great satisfaction.

Max Thorner^{9, 196} tried Hunter's modified tuberculin in two cases. While these observations are far too limited to arrive at any definite conclusions, the results obtained so far are very encouraging. In both cases the initial dose was $2\frac{1}{2}$ milligrammes ($\frac{1}{25}$ grain), increased in one case gradually to 100 milligrammes ($1\frac{3}{4}$ grains), in the other to 35 milligrammes ($\frac{1}{2}$ grain). In the first case the temperature was only once up to $100\frac{2}{5}$ ° F. (38° C.); at all other times, as well as in the second case, it ranged steadily between 98° and $99\frac{3}{5}$ ° F. (36.7° and 37.6° C.). The local improvement was pronounced in both cases,—swellings decreased in size, superficial ulcers healed. At no time was there any severe reaction, either locally or generally.

Heryng, of Warsaw,¹¹ publishes the results obtained by him in two hundred and fifty-two cases of laryngeal phthisis, but, the paper not being concluded in time for this issue, a *résumé* of it will appear in our next.

Lupus.—A case of lupus of the skin, mouth, pharynx, and larynx, with pulmonary phthisis, is described by Norris Wolfenden.¹¹ The patient was a girl, aged 19, whom he saw for the first time on April 19, 1893. She said she had been ailing since October, 1891, when she suffered from influenza, and in January of last year she lost her voice, with cough and expectoration, which continued until June, when she almost completely recovered. She fell ill again in August, 1892, and has been unwell ever since. When he saw her an abscess had broken in the jaw, which had continued to discharge since. A lump was seen near the inner angle of the eye, being apparently a tubercular nodule. The epi-

glottis was almost completely destroyed, only the base remaining. The inter-arytenoid commissure and the ventricular bands were enlarged with lupoid infiltration, the cords being hidden. The base of the tongue was lifted up into nodular folds, and was much fissured. Both lungs were extensively infiltrated with tubercular deposit, but no indication of active mischief was discovered anywhere. Surgical treatment seemed difficult to carry out in such a case, and, after consultation with Heron, it was decided that tuberculin should be given a trial. This not being procurable at the time, injections of tuberculocidin—a product introduced by Klebs to supplant tuberculin, the irritating and pyretic properties of which were extracted—were made. She was given, in all, thirteen injections in increasing doses. There seemed to be some reaction after the first dose or two, the injections being made in the neighborhood of the lupoid tissue of the face. The reaction only lasted a day or two, and even when the dose was carried to 0.2 cubic centimetre (31 minims) no further effect was apparent. Some improvement was noted in the condition of the tongue, which was less tender and did not bleed so much. On one occasion, when the injections had been suspended for a day or two and were recommenced with a stronger dose, the temperature went up to 102° F. (38.9° C.). The interesting point was the association of lupus with tuberculosis of the lungs. He alluded to a paper by Malcolm Morris, which seemed to show that patients who had been treated by tuberculin were subsequently more amenable to surgical measures.

Mark Hovell, of London,^{11 June} also described a case treated with tuberculin. The patient, a clerk aged 17, had been seen first at the London Hospital, suffering from dyspnoea. Tracheotomy had to be performed in May, 1890. Treatment by cauterization had been applied for a long time, both before and after tracheotomy. At the latter end of 1891 Koch's remedy was tried, and the patient received about fifty injections, and was much improved by the treatment. Since that time no treatment had been applied, and the disease appeared to have become quiescent. The discussions elicited by papers on the subject, however, indicated that the general opinion as to the value of tuberculin in the treatment of laryngeal lupus was unfavorable. Lactic acid after scraping is a much more effective agent.

Syphilis.—Fasano¹⁰⁹⁷_{Nov., '92} reports two new cases of laryngeal syphilis and tuberculosis, which may be added to three already reported, making, in all, five reported by him. All demonstrate, in a clinical manner, that syphilitic disease may, in the larynx, change into tubercular. According to the author, this may be explained through the fact that, being of a parasitic nature, the bacteria of the one disease may prevail over and destroy those of the other. The author, who was one of the first to admit and recognize the possibility of this substitution process, allows that it is very difficult to demonstrate, experimentally, how and when this change takes place. As he is obliged to rely upon clinical evidence only, he believes that it is not a question of symbiosis (co-existence of syphilis and tuberculosis), but of transformation of the one process into the other, and this through the action of Koch's bacilli, which reach the parts through the lymphatics. Fränkel's theory of local infection seems, to the author, not likely to be sustained; for, if it were so, primary laryngeal tuberculosis ought to occur very frequently, whereas, up to the present time, only a few exceptional cases of this character have been reported. (Report of Corr. Editor Massei, Naples.) A case was also reported by Ramon de la Sota, of Sevilla.⁹¹⁸_{Feb., '92} Schnitzler, of Vienna,⁶⁹_{Sept. 14} considers that treatment of the syphilitic aspect of the case should first be carried out.

Cases of syphilitic laryngitis due to inherited syphilis are related by de Havilland Hall, of London,¹¹_{June} and Chiari, of Vienna.¹⁵⁸_{B.15} In adults an element of doubt must always enter the field of inquiry. In Chiari's case, however, the patient was a boy of 4½ years, of syphilitic heredity, who had been brought to him for grave dyspnœa, which had been developing for six months. The laryngeal mucous membrane was found to be reddened and thick below the vocal cords; the right arytenoid cartilage, very thick, was in adduction and immobile; the right vocal cord was deeply ulcerated in its middle third. Mercurial treatment was at once instituted, but on the third day tracheotomy became necessary. The cannula was left in place for seven weeks, at the end of which time, under mixed treatment, the larynx had become normal, with no visible cicatrix on the vocal cord. De Havilland Hall rapidly cured his case with iodide of potassium.

Stenosis.—G. M. Swift, of New York,¹_{Apr. 15} suggests that in

cases of laryngeal dyspnœa, where there is doubt as to whether the dyspnœa is due to mechanical obstruction or to spasm, it is a simple matter to give a child enough chloroform to relieve the spasm, if it exist; in cases of simple croup this procedure is sufficient to relieve the symptoms of obstruction, and to satisfy one that no mechanical obstruction exists,—at least, not enough to demand operative interference. In the case of a child of 18 months the dyspnœa of laryngeal croup was so marked that the reporter, Betz,^{186 Mar.} proposed tracheotomy, which, however, was rejected. Three drops of a mixture of ether sulph., 3 parts; acetic ether, 1 part; menthol, 0.1 part, were ordered to be inhaled every quarter of an hour, just as chloroform is inhaled. It was hoped that the cold from the evaporating mixture would contract the surface blood-vessels of the larynx, and thus reduce the œdema present. The child was seen again in two hours, and the condition had somewhat improved. The etherization to be continued, 3 to 4 drops every half-hour. After six hours the condition was unmistakably better,—so much so, in fact, that the etherization could be dispensed with. A piece of intestine filled with ice was placed around the child's neck. After this, progress was so rapid that in twenty-four hours the child was out of danger.

Massei, of Naples,^{37 Dec.} employs intubation to cause thorough reduction of pedicles in incised laryngeal webs. W. K. Simpson, of New York,^{59 Apr. 15} reports five cases of non-membranous stenosis, in which intubation (O'Dwyer tubes) was utilized with marked advantage. A syphilitic papilloma was found, after three and a half days, to have disappeared almost entirely. In the second case, one of inflammatory thickening, the tube was introduced repeatedly after long intervals, finally giving excellent results. (See Section E, this volume.)

Laryngeal Paralysis.—F. Semon's (of London) splendid article, "The Study of Laryngeal Paralysis Since the Introduction of the Laryngoscope," contributed by him to the *Festschrift*, dedicated to Virchow on the occasion of the latter's seventieth birthday, is reviewed by Dundas Grant, of London.^{11 Apr.} The credit of having first recognized a laryngeal paralysis by means of the laryngoscope is attributed to Traube. Considerable attention is given to the question of the greater proclivity of the abductors than of the other laryngeal muscles to become paralyzed in cases of lesion of

the vagus or recurrent laryngeal nerve. Semon asserts and defends his own well-known views, narrating his experimental and clinical observations. He adduces, among other facts, the early atrophy and destruction of the abductors in cases of organic lesion of the nerves, the relatively early death of the abductors in experimental lesions of these nerves, in favor of the view that there is an actual difference in the biological composition of the said muscles and nerve-endings. The existence of the same peculiarity on the part of the abductor nerve-nuclei in the medulla is indicated by the early tendency of these nuclei to succumb in cases of tabes dorsalis. He quotes and criticises the arguments and opinions of Krause, Wagner, and the others who have taken part in the controversy. The question of the cortical centre for phonatory movements is next considered. Founding on experiments made along with Victor Horsley, he insists that the cortical centre of either side controls both vocal cords, and that therefore a paralysis of one cord cannot result from a lesion of the cortex of the opposite side. He was unable to corroborate Masini's experimental result that very weak stimulation of one cortical centre can produce movements of the opposite cord, and he rejects Garel's otherwise convincing case of unilateral laryngoplegia on account of the absence of the histological examination of the medulla. In view of the non-occurrence of aphonia in comparison with the regularity of occurrence of aphasia in right hemiplegia, and in view also of the difficulty of excluding a bulbar lesion, he advises a very skeptical consideration of cases in which a cortical lesion is believed to have caused unilateral laryngeal paralysis. Semon is in favor of the generally-received view that the motor supply of the larynx (recurrent, at least) is derived from the spinal accessory. Conflicting opinions are quoted. The central causes of laryngeal paralyses are touched, and some attributed to bulbar disease are believed by Semon to be due to lesions higher up. Burger's recent studies on the occurrence of laryngeal crises and paralyses in locomotor ataxy are abstracted and eulogized.

In reviewing a recent paper by Burger, of Amsterdam,⁴⁰⁴ in No. 57 which the latter author concludes that Krause's hypothesis cannot be supported, and that Semon's conclusions agree with clinical experience, his views resting, besides, upon a physiological basis of advanced experimental work, Michael, of Hamburg,¹¹ Mar. remarks

that the divergence between Krause and Semon will never disappear so long as the authors will not allow that both views may be right. In most cases, without doubt, he thinks, a paralysis of the postici is the cause of the characteristic position of the cords. In a few cases the complex of symptoms is produced by contraction of the adductors. Such cases he had called "dyspnœa spastica," first described in 1885. Similar observations had been published by Krause, Heryng, and Eisenlohr. The cessation of the dyspnœa during chloroform narcosis and the combination of the dyspnœa with aphonia spastica are characteristic of contraction. His own case had been under observation for nine years, and even now it is impossible to remove the cannula. The aphonia also remains unchanged.

Semon²⁶ July showed a case of right hemiplegia with paralysis of the right half of the soft palate, and abductor paresis of right vocal cord, the last-named certainly not of cortical origin, at the last meeting of the Laryngological Society of London. A girl, aged 19 years, received a severe burn and also a fright by a box of matches getting alight in her hand. Next morning she was unable to speak or to move her right arm and leg. Fluids also came back through the nose. After remaining in this condition for three or four days she gradually improved, and at the time of the meeting showed the following signs: The right half of the palate acted less to faradism, and the left half was decidedly more drawn up on phonation than the right. In the larynx the right vocal cord stood very near the median line, in phonation moving inward and meeting the left cord. On inspiration the right cord returned to its previous position very near the median line, while the left was well abducted. In deep inspiration the right cord did not go any farther outward, while the left went completely to the side of the larynx; the right arm was colder than the left, and the flexion of the elbow and the rotation of the shoulder weaker than on the left side. As to the legs, there was slightly less power on the right than on the left side.

The question of interest in this case is whether the abductor paralysis of the right cord and right side of the soft palate is of cortical origin or not. With regard to the palate, Horsley has obtained experimental evidence of a unilateral cortical centre, and therefore, though this is not supported on any clinical grounds,

the question must be left open. The laryngeal paralysis, however, Semon considers, is certainly not cortical in origin, and for the following reasons: 1. The cortical centres, which exist in the third frontal convolution, for laryngeal movements are bilateral,—*i.e.*, stimulation of *one* produces movement in *both* cords. Therefore clearly destruction of one centre only will not produce paralysis of the cords at all, as the movement will be carried on from the opposite side. 2. The only movement produced by cortical irritation is that of *adduction*, the *abductive* movements being started in the medulla. Cortical paralysis ought, therefore, to interfere with phonatory movements, and cannot cause the abductor paralysis noticed in this case. This difference in the nervous relations of the two movements is only what one would expect from a consideration of their respective nature; adduction is voluntary, and therefore naturally is started from the cortex; abduction is involuntary, and is represented in that great centre of automatic movements, the medulla. The inference to be drawn from all this is, that the paralysis of the larynx in this case is due not to disease in the cerebral hemispheres, but to some lesion farther down.

Onodi, of Budapest,^{37 Aug.} communicates a very interesting case of bilateral aneurism of the aorta, causing a peculiar form of paralysis of the muscles of the larynx. The right vocal cord was immobilized in the cadaveric position, while the left approached the median line. Section showed that the right recurrent was affected in its entire length by the aneurism, while the left recurrent was but partly compressed by the aneurism of the left side. In examining preparations of isolated muscles with their nerves separated, a degeneration of all the muscles and nerves of the right side were found, while on the left side only the posterior crico-arytenoid and the internal thyro-arytenoid, with their nerves, were altered. The lateral and transverse muscles were least affected. Katzenstein^{136 Jan. 15} reported a case of bulbar paralysis in which the left of the palate and the left vocal cord were paralyzed, the larynx being insensible. The median position indicated a previous affection of the posticus. Cocaine caused no change, showing that it was a case of reflex spasm.

In a horse suffering from laryngeal dyspnoea ("roaring"), Wolstenholme, of Manchester,^{2 Apr. 29} found extreme atrophy of the arytenoid and posterior crico-arytenoid muscles on the left side.

Laryngismus Stridulus; Spasm.—In a review of the subject, John O. Roe, of Rochester, ⁶¹_{Jan. 21} concludes that in the causation of laryngismus stridulus we must have the following conditions: 1. A chronic irritation of the larynx. 2. An abnormal activity of the laryngeal motor centres in the medulla, rendering them more susceptible to the normal blood-stimulus, and also more sensitive to irritation applied to the peripheral nerve-filaments, as a result of irritation of the larynx. 3. An unequal susceptibility of the adductor and abductor muscles to local irritation and also to the normal blood-stimulus. The abductors of the larynx, situated on the outer portion of the laryngeal frame-work, are not so much subject to local irritation; their motor centre in the brain is less excited and less susceptible to normal stimulus, and thus spasm of the abductor muscles is less frequent than spasm of the adductor muscles and less persistent when it occurs. W. Peyre Porcher, of Charleston, ¹_{Aug. 26}, reports a case of complete glottic spasm in an adult, followed by unconsciousness and prolonged drowsiness. Leo, of Bonn, ⁶⁹_{Aug. 24}, cites a case of death from hysterical spasm in a young man, aged 21 years, who had presented, when 11 years old, choreiform phenomena, involving the left half of the face and the left arm.

Dysphonia Spastica.—Farlow, of Boston, ⁹⁹_{June 8}, described the case of a man, 46 years of age, who had suffered for three years from this affection. On attempting to speak he had a spasmodic closure of the glottis, and had to strain, to force out the words, in a way very suggestive of defecation. He was a worker in mercury, and was under the impression that the mercury was the cause of his trouble, but there was no other sign of mercury poisoning and no mercury in the urine. Nothing abnormal was seen in nose, throat, or larynx, and he seemed in robust health. His habits were good, and there was no nervous disease and no history of syphilis. Galvanism, faradism, massage, strychnia, etc., have all been tried, but to no avail.

Hysterical Aphonias.—Bearing upon the etiology of the affection is the case reported by S. Johnson Taylor, ²_{Nov. 19}, which had resisted every treatment. The voice finally returned of its own accord thirteen years after its loss, as the ultimate result of the removal of an ovarian cyst. Seiffert, of Würzburg, ¹¹_{No.}, recommends systematic concussion and compression of the larynx during phona-

tion. Scheppegrell, of New Orleans, ⁹ in reporting three cases, alludes to one in which tracheotomy had been resorted to before the case came to him, under the belief that the condition was that of bilateral abductor paralysis. He draws attention to the fact that in hysterical aphonia the whisper is natural, whereas in abductor paralysis it is a bruit. In the former cough is frequently present, but it is never found in true paralysis. In the first stage of chloroform anaesthesia the voice will be restored unless true paralysis exist.

Bach, of New York, ¹ _{Oct. 22; Nov. 19} ² states that the greatest difficulty with the hysterical patient is the production of the first tone. This can always be overcome in a few minutes with the assistance of reflex action. For this purpose a mild irritant, whether mechanical or chemical, may be applied to the larynx so as to excite cough. When the interlaryngeal anaesthesia is great, it may become necessary to inject some non-irritating fluid—for instance, warm water—into the larynx, which, running into the trachea, will readily induce cough. Having excited this cough once or twice, the patient will be able to reproduce it independently of the irritant. It now becomes a simple matter to continue this cough, and to pronounce more or less distinctly the vowel “a” at each effort, and after a few trials to substitute the vowel “e,” and so on, until all the vowels have been coughed. After this is repeated several times, the element of cough can easily be eliminated from the vocalization when the pure vowel sound is left, which, without effort on the part of the patient, can be combined with consonants, as, for example, with “d,” “ad,” “ed,” “id,” etc., first placing the vowel before the consonant and then reversing this order. It would not be advisable to attempt the articulation of words at this stage; it is better to combine the vowels with single consonants, gradually increasing the duration of the sound. The patient is thus led to utter words without the power of resistance, either willful or otherwise. Ficano ³⁷ _{Dec.} and Kayser ¹¹⁶ _{No. 3} report each a case of hysterical mutism. A case of hysterical aphonia with perfect singing voice is described by E. Harrison Griffin, of New York. ¹ _{May 20}

Laryngeal Tumors.—What might be termed a “traumatic” tumor is reported by S. G. Dabney ⁹ _{May 6} as having been observed by him. The patient, male, had received an external wound of the neck two months previously, which had been sewn up. Since that

time his voice had been reduced to a whisper. Laryngoscopic examination revealed a tumor, the size of a raspberry, beneath the vocal bands. On removal of this mass there was found to be imbedded in it a suture about one inch in length. This had caused the growth of the granulation tissue about it, and its removal was followed by complete restoration of voice.

Among the many cases of *papilloma* reported, but few presented features of special interest. Macintyre¹¹ describes a case in which there were not only papillomatous growths of the larynx and trachea, but also of the bronchial tubes. Those in the latter situation gave rise to symptoms that led the patient to be treated for phthisis. The laryngeal and infra-laryngeal growths were removed instrumentally, and some time after a small papillomatous mass was coughed up, followed by slight haemorrhage. More papillomatous excrescence was coughed out five months before the presentation of the paper, about four years after being first seen. The patient recovered perfect health. A subglottic papilloma of the larynx, in connection with tubercular disease, is reported by J. Cox, of Victoria.²⁸⁵ Moritz² describes the cases of twin sisters, aged 20 years, who were both affected with papillomata of the larynx. The theory which had been advanced, that papillomata of the larynx might be caused by the inhalation of amniotic fluid mixed with gonorrhœal discharges during birth, found no support in these cases, as the mother gave no history of fluor albus and the patients had no ophthalmia neonatorum. One of the patients began to suffer from hoarseness when 2 years old. In her case the larynx was found almost filled up with papillomata, springing from the right vocal cord, the right ventricle, and ventricular band. The other patient commenced to suffer from hoarseness when 18 years old. In her case also the right vocal cord was affected, presenting several papillomatous excrescences on its upper surface and along its free margin. Moritz removed the growths with a forceps of his own. The patients had fully recovered their voices, though in one of them a small papilloma had recurred.

J. A. White⁶¹ reports the case of a boy, aged 5 years, in whom the growths recurred quickly and luxuriantly after each operation. Tracheotomy finally became necessary. After an absence of three months the growths were found to have greatly diminished; three years later they had completely disappeared. F.

Massei⁶⁷³ gives an outline of his views on the subject, quoting those of Garel, Causit, and Thost. The regressive phase which commonly succeeds the progressive one after a certain time, and which is followed by certain dangerous complications, such as narrowing of the larynx, merits, he thinks, the greatest attention, not only as regards our knowledge of the nature of these growths, but also as regards their treatment. He alludes to the interesting labors of Norris Wolfenden and Martin in this connection. The presence of small round-cells causes a papilloma to resemble a granuloma; hence the possibility of a retrogressive stage which may end with disappearance of the neoplasm. On account of this the author wonders whether it is right to continue to include these papillomata among the tumors of the larynx.

The treatment advocated is in complete accord with these views. When it cannot be continued *per via naturale*, or when there is danger in doing so, resort should be had to tracheotomy. Laryngotomy and laryngectomy are not justifiable, and tracheotomy may be sufficient for recovery. Ichthyol and curetttement are also recommended.

Lavrand, of Lille,¹³⁶ attaches considerable importance to repeated irritation and a catarrhal process in the development of these growths,—doubtless an important element in the explanation of the retrogressive stage following tracheotomy in some cases.

F. E. Waxham, of Chicago,⁶¹ reports a case in which the patient, a boy 6½ years old, has worn an intubation tube for four years. Chromic acid, applied to destroy the neoplasm, having caused adhesions, tracheotomy became necessary, the adhesions being then broken up through the aperture procured by a laryngotomy. A small intubation tube was again introduced, the tracheotomy tube being finally removed two years later. The child is well, and it is hoped that sufficient room for normal respiration will finally be obtained. Stadler, of Bremen,²⁰⁵⁸ reports six cases treated by laryngo-fissure. Two cases were cured, three became aphonic, and one died. J. Bark, of Liverpool,¹⁸⁷ in reporting a case, speaks highly of Grant's guarded forceps.

Paul Koch, of Luxemburg,³⁷ describes a case of *fibroma* which presented as a feature of special interest its enormous size. It was the size of a large hazel-nut and weighed 738 grammes (*sic*) (1½ pounds!). Evidently the printer forgot to insert a decimal

point after the 7, which would leave the weight 7.38 grammes ($\frac{1}{4}$ ounce). Dyspnoea was the only prominent symptom, the situation of the growth causing no interference with the vocal bands. Hoarseness supplemented dyspnoea in a case reported by J. E. Boylan, of Cincinnati.⁴⁵¹ A large growth removed by A. W. MacCoy, of Philadelphia,¹ from the larynx of a phthisical patient, proved to be composed of interlacing bundles of dense fibrous tissue covered with thickened layers of mucous membrane. Moure, of Bordeaux,¹¹ June removed an *angio-keratoma* the size of a millet-seed, and of rosy color, with small ecchymotic points upon its vascular surface, from the upper surface of the right vocal band, upon which it was sessile. Microscopically examined by Sabrazès, it was found to resemble those growths of the skin described by Dubreuilh, in 1889. The patient had upon the dorsal face of the index finger a small growth, which proved, on examination, to be a fasciculated sarcoma. The co-existence of an innocent laryngeal growth and a cutaneous malignant growth is interesting.

An important observation in connection with the malignant transformation of benign growths is given by Sokolowski, of Warsaw.⁵²⁰ Nos. 1, 3; Aug. 1¹³⁶ The patient, aged 64 years, who had complained of hoarseness for two years, had, upon the posterior third of the left vocal cord, a tumor the size of a hazel-nut, red, soft, and movable; beside it, at the extremity of the false cord, was another tumor, as large as a pin's head. The larger was removed as a polypus, and at the end of four years the patient returned, again complaining of hoarseness and pain on the left side. A red, soft tumor was found at the end of the false cord, as well as another smaller one. The general health, as before, was satisfactory, but a malignant tumor was suspected, and both were destroyed with the galvano-cautery. Eight months later the patient presented himself at the clinic of Heryng, whose assistant, Lublimer, published the case as one of "adenoma laryngis."⁵⁵¹ No. 28, 192 This diagnosis was based upon microscopical examination of a fragment of the tumor from the left false cord. Five months later the patient was examined with the same result, the left false cord being entirely infiltrated, while there was a diminution in the mobility of the left half of the larynx. The tumor removed five years previously had, fortunately, been preserved in alcohol, and was now exam-

ined, proving to be an adeno-carcinoma. This diagnosis was confirmed by later observation of the patient, who returned to Sokolowski's clinic. The general condition was bad; the hoarseness had increased, and the laryngeal pain was greater. There was infiltration of the left false cord, which was almost immovable. Laryngo-fissure was performed by Kosinski, and the left vocal cord, true and false, entirely removed. Microscopical examination of the fragments by Przewoski confirmed the first diagnosis, of adeno-carcinoma. If the first tumor had not been preserved, the case might naturally have been supposed to have been one of transformation of a benignant into a malign tumor. One should therefore be reserved in making the diagnosis. The author believes the case to have been simply one of primary adeno-carcinoma.

Leprosy of the Larynx.—In a noteworthy article, de la Sota y Lastra, of Sevilla,⁹¹⁸ Oct., Nov., Dec., 1922 publishes a review of the subject, which his remarkable experience (thirty-two personal cases) alone rendered possible. In his opinion, however, considerable evidence is necessary before the contagiousness or non-contagiousness of leprosy can be affirmed. He shows that leprous laryngitis is not a necessarily fatal localization of the disease; it is only in exceptional cases that the stenosis is great enough to cause death. The most successful local treatment he has found to be destruction of the leprous tubercles with the galvano-cautery; this is much more rapid and efficacious than intra-parenchymatous injection of lactic acid.

Pachydermia.—After reviewing the literature of the subject, McBride, of Edinburgh,³⁶ Apr. describes four cases of his own, a colored plate being appended. The differential diagnosis of the affection, from the form of laryngeal growth with which it may be confounded,—inter-arytenoid tumor of phthisis,—is given as follows: Idiopathic pachydermia: (1) swelling arises gradually, without any definite margin so far as shape goes (although the color is distinctly defined); (2) the color is distinctly defined, being of a whitish gray, with just a tinge of pink; (3) the outline is smooth or finely granular, with sometimes a furrow or cleft. Inter-arytenoid tumor of phthisis, or, if preferred, phthisical pachydermia: (1) swelling is distinctly a tumor, with more or less well-defined margin; (2) the color is usually red or pink; (3) the outline may be smooth or coarsely papillary.

Küttner, of Berlin,⁴ ⁸¹⁴ describes two cases of diffuse pachydermia laryngis (Virchow), after careful microscopical examinations. Ulcerating processes were present, but Küttner states that they rarely occur, and only as a result of some other condition. In the one case the ulceration was due to a perichondritis, with formation of pus, occurring as a complication of typhoid fever. In the second it appeared in a syphilitic after the pachydermia had completely developed. The slight concavity usually present in these cases in the neighborhood of the vocal cords is due partly to the anatomical condition of the parts, as was first demonstrated by Virchow (the subepithelial tissue so firmly binding the epithelial layer to the perichondrium that it prevents its uniform expansion when infiltration takes place, thus producing a depression in the centre), and partly to the pressure produced by the action of the vocal processes upon each other (Fränkel). The author warns against the hasty diagnosis of cancer when an atypical epithelial excrescence is present, as this condition can develop into a case of pachydermia, lupus, syphilis, or other conditions. Two cases are described by Semon, of London,¹¹ and one each by Massei and Damieno, of Naples,¹¹⁰⁵ _{v.12, No. 3} and W. Milligan, of London.⁴⁶¹ _{Aug.}

Fracture.—Scheier,⁶⁹ _{No. 33} in reporting a case, considers, with Arbuthnot Lane, who found nine fractures in one hundred cadavers, that the rarity of laryngeal fractures is very much overestimated. He produced the condition in the cadaver, either by lateral pressure or by a blow upon the anterior region. Lateral pressure determined either complete fractures of the hyoid bone or cartilages, or simple fissures. Direct blows always injured the cricoid cartilage, often the thyroid, but rarely the hyoid, the mucous membrane remaining intact. He did not observe the lesions of the vocal cord described by Scheff. The prognosis is always unfavorable, and tracheotomy is often necessary. Secondary stricture is frequently seen. To prevent stenosis, thyrotomy may be performed instead of tracheotomy. Cases are also described by W. J. Taylor, of Philadelphia,⁷² _{May} and Szowrski, of Posen.¹¹ _{Mar.} R. H. Grube¹⁶¹ _{Sept.} reports a case in which the cricoid alone was involved.

TRACHEOTOMY.

Carron de la Carrière³⁵ ¹⁰⁶⁹ _{Feb. 8; May} says that, in general, the indications as to the time of performing tracheotomy are fairly clear.

The operator should base his judgment upon the labored inspiratory efforts rather than upon the attacks of threatened suffocation. When the former have been present for some hours, without, however, increasing markedly or threatening the life of the patient, it is proper to wait. When the inspiratory effort is persistent and gradually increasing, and the first signs of asphyxia are becoming apparent, it is the moment to operate, the child being still resistant and the asphyxia not having yet brought about a condition of anaesthesia. When there are attacks of suffocation, but when between them the inspiratory efforts are little or not at all labored, it is proper to wait; for it is very exceptional for the child to die in one of these paroxysms of dyspnœa, however painful and dangerous they may appear.

H. R. Wharton, of Philadelphia, ¹⁹_{June 17}, reports the case of a child, 18 months old, suffering from diphtheritic croup, in which a tracheotomy tube was worn for sixty days. Stickler, of Orange, N. J., ⁵⁹_{Apr. 29} to remove a foreign body from the right bronchus, opened the trachea from the isthmus of the thyroid to the bifurcation. Baer, of Zurich, ³⁰¹_{Bd. 35, H. 3, 4; June}, ⁵ gives the results of treatment by tracheotomy and intubation in 690 cases of diphtheria. His conclusions are presented in Section E, page 5, of this volume. Hasb ³⁰¹_{B. 34, H. 6; Aug.}, ³⁶ publishes the results in 572 tracheotomies for diphtheria. The mortality was 316, or 55½ per cent. The cases occurred during six years, and the months from November to March were those in which the mortality was greatest, the maximum being reached in March. The mortality proved highest in infants, and in children over 6 years of age it again rose, being 59 per cent. after the tenth year. The fatal cases usually terminated during the first five days after operation. If this period be passed a fairly good prognosis can be given, though the danger of pneumonia at a later period must be kept in view as a cause of death.

W. Turner, of London, ⁶_{Sept. 30} cites a case of tracheotomy in which a dangerous complication ensued upon the use of a double celluloid tube. The main cannula had become detached from the guard-piece, and become drawn into one of the bronchi. Inversion of the child and compression of the chest caused it to come within reach, when, the tracheal wound having been enlarged, the cannula was withdrawn, as the child was becoming pulseless.

LARYNGECTOMY.

Poppett⁶⁹,² Aug. 31; Sept. 30 refers to the mortality of this operation, which has not hitherto diminished proportionately to that of others. The chief danger lying in the connection of the wound with the pharyngeal cavity, endeavors have lately been made to shut off the wound from the pharynx. In Schmid's case the patient could speak with a pseudo-voice without any apparatus. Bardenheuer has shut off the wound, but only temporarily. The author records a case in a woman, aged 68, whose larynx he extirpated for carcinoma. After the larynx was removed there was a communication with the pharynx the size of a two-mark piece. This was carefully sewn up. The patient made a good recovery, and there was no return in the course of eleven months. The advantages in this procedure consist in the avoidance of pulmonary complications and in the after-treatment, for this patient could take fluid nourishment after the operation, so that the stomach-tube was not needed. The patient could make herself understood with a whispering voice almost at once, and this afterward became stronger. The author then discusses the mode of production of this voice. The pseudo-voice in Schmid's case is different; here the air in the pharynx is forced through a cleft produced by contraction of the muscles. It did not appear for a year and a half after the operation, and the author does not expect it in his case. If this pseudo-voice appeared regularly, the artificial larynx could certainly be done away with. At any rate, the pharynx should be shut off at the time of the operation, and an opening made later, if an artificial larynx be deemed advisable. In not a few cases the patient can get on very well with this whispering voice, especially in cases where a quick recurrence is anticipated. The author thinks that by the above-described procedure the mortality may be very considerably diminished. In cases where, owing to extensive disease, a large part of the wall of the pharynx must be removed, a complete closing of the pharynx may be difficult. Such cases, however, are better not operated upon.

J. Solis-Cohen has published¹⁰⁴,¹ July 16, '92; Oct. 15, '92 a report of the successful removal of a larynx for malignant disease. The case had been under the observation of laryngologists for about twenty years, and Lefferts, of New York, had reported upon it in 1876, concerning his removal of a large papilloma by an intra-laryngeal

operation. After ten years of comparative freedom from discomfort a recurrence of painful symptoms began, and the case grew worse until, in January last, the patient applied at the dispensary of the Jefferson Medical College. After a preliminary tracheotomy had been performed, operations with forceps and by other means removed parts of the tumor, which at the time was held by the microscopists who examined the specimens to be sarcomatous. These operations improved the patient's condition temporarily only, and extirpation was proposed. The patient consented, and on April 1st the radical procedure was undertaken. The incision was everywhere made through healthy structure. The diseased skin and adjacent morbid tissues were circumscribed by elliptical incisions through the sound skin, these latter being carried gradually deeper until with the fingers the larynx could be separated from the underlying parts. A tampon cannula resembling Tredelenburg's was then substituted for the ordinary cannula. Anæsthesia by chloroform was continued through the substituted cannula, as it had before been effected through the simple cannula. The larynx was cut away, sparing the œsophagus entire, going down to the first ring of the trachea. The soft parts were brought loosely together with sutures, leaving a space at the upper portion of the wound for the insertion of a soft-rubber stomach-tube. The operation occupied an hour. J. Solis-Cohen remained with his patient for sixteen hours, and otherwise insured an unceasing watch over the case for several days. Two members of the staff spent eight hours with the man, and during that period saved his life twice, death by suffocation from clogging of the cannula with mucus being imminent. The close attention given the case for eighty hours by the hospital *attachés* insured the man's survival from the dangers of the operation. The œsophageal tube did not appear to be necessary, and was removed on the third day. Enemas were used for four days, when gradually feeding by the mouth was resumed. Recovery was uninterrupted.

No attempt has yet been made to introduce a voice-tube, for two reasons: first, no such tube has been at command; second, the indications are imperative, in the mind of the surgeon, to keep the wound free from all possible sources of irritation until the question of the recurrence of the growth has been answered. Of the nature of the tumor removed the author does not speak posi-

tively, but it is evident that he inclines to the belief that it was no longer benign in character at the time of its removal. The reports of the microscopists are not in full harmony. The author believes that an interval of some years occurred between the date of the removal of the papilloma and that of the malignant development on the site of the old cicatrix. He draws not a few instructive deductions from the course of his case, but we have space only for the following: "There is one clinical point which has been a revelation to me,—that is, the freedom from pain, from cough, and from dysphagia. Should there be no recurrence in this case, we have every reason to be satisfied with the result. Should recurrence ensue, the patient will have been relieved from suffering for some time." The patient is now wearing a single rectangular tube with a very slight amount of paraphernalia.

At the German Surgical Congress, held in June, Julius Wolff was able to present a patient who had undergone the operation for relief from carcinoma. After other surgeons in Berlin had refused to take the case, Wolff had done the operation, and, by the kind assistance of du Bois-Reymond, an artificial larynx had been constructed. With it the patient could not only speak, but even make some attempts at singing.

Cohen^{1 Nov. 12} also performed laryngectomy for adeno-carcinoma. One operation was a unilateral exsection of the soft tissues with an anterior strip only of the thyroid cartilage, in accordance with the modified laryngectomy described some time ago by him. The patient died of inspiratory pneumonia within forty-eight hours. The other operation was a complete laryngectomy with preservation of the greater portion of the epiglottis. The patient had an interrupted recovery.

Lauz, of Berne,¹¹ presents a report on twelve laryngectomies during ten years at Kocher's clinic. In two cases an early diagnosis could be made, and excision of the diseased parts was sufficient. One of these cases is, up to now, free from recurrence, fourteen months after operation; in the second case local recurrence had necessitated operation. Partial extirpation of the larynx has been performed in five cases,—in two for lupus, in one for sarcoma, and in two for carcinoma. Total extirpation was performed in six cases on account of carcinoma. Only one of these cases died from the operation; in the other recurrence followed a short time after.

Périer¹⁰ _{July 18} describes a case of total extirpation of the larynx without preliminary tracheotomy, in a man 62 years old, suffering from laryngeal epithelioma for two years. Having laid bare the laryngo-trachea by means of two trapezoid flaps circumscribed by one vertical and two transverse incisions, and having sutured the trachea on each side, he passed a cannula behind it, between its first ring and the œsophagus, penetrated it transversely with one incision, and, drawing it out, introduced a conical cannula, thus permitting chloroformization to be continued. He then easily separated the larynx from the pharynx, suturing the orifice of the latter to the upper transverse incision to a sufficient extent to permit the index finger to enter the pharynx, the lips of the transverse incision being then sutured to each other to the right and left of the pharyngeal orifice. This done, and the lateral flaps sutured between them, the cannula was withdrawn and the trachea united to the lips of the inferior transverse incision. There were no symptoms after the operation, and the wound healed in eight days. Histological examination of the tumor showed it to be a lobulated pavement epithelioma. The separation of the pharynx from the trachea was complete, but speech was possible and distinct, by the addition of an apparatus which threw a certain quantity of air into the superior orifice, communicating with the pharynx; the lower, or tracheal, orifice served only for respiration.

ŒSOPHAGUS.

Œsophagitis.—Sclavunos²⁰ _{Aug., Oct.}³⁶⁰ reports a case of œsophagitis dessicans superficialis described by Rosenberg in 1892,—a disease of the œsophageal mucous membrane in which the epithelial layer becomes detached in a single piece, preserving its tubular form, and is expelled. Birch-Hirschfeld and Reichmann had previously described similar cases under different names. Sclavunos's case, the fourth on record, is that of a man of 25 years, who drank a great deal of alcohol, and who suddenly began to vomit large quantities of blood. In examining the throat a membrane in the form of a tube, fifteen centimetres long, was found protruding into the buccal cavity. Attempts to remove it caused violent pain from traction, and the author therefore removed as much as possible with the scissors, leaving the remainder in the œsophagus. Cure was rapid and complete. Fearing fraud on the part of the patient,

the physician sent the membrane to the Anatomical Institute at Würzburg, where the diagnosis was confirmed.

Stricture.—Abbe ⁵⁹_{Feb. 25; Sept. 9} describes a new method of dividing cicatricial stricture of the œsophagus, which he practiced with very good results on a patient aged 30. After the performance of gastrostomy, a digital examination is made of the lower œsophageal orifice, and a small, conical, gum-elastic bougie is guided into the canal by the finger. A string of heavy-braided ligature silk is carried from the stomach to the mouth by passing a very small bougie through the œsophageal stricture. In the case reported by the author the upper end of the string was brought out by the neck through a wound which had been made in an unsuccessful attempt at external division of the stricture. A larger bougie is now passed from the stomach alongside the string, and pressed tightly into the stricture so as to stretch it. The string is now drawn upward by the fingers, passed to the back of the patient's mouth, and the bougie will be felt to advance at once as the string makes its way into the tense stricture. Larger bougies are now passed, and the string is "see-sawed" upward and downward. When the largest size has been passed, a rubber tube of corresponding size is drawn through the œsophagus past the point of stricture, its lower end remaining outside the wound in the stomach. A smaller tube is passed into the stomach for nourishment. The patient can thus drink water for refreshing the mouth, and swallow saliva without contaminating the wounded surface, which the tube also serves to keep dilated. The large tube may be removed on the second or third day, and dilating bougies be introduced by the mouth after the fourth day. Finally the gastrostomy wound may be closed, whenever the patient has gained strength, by a plastic operation.

Tuberculosis.—Flexner ⁷⁶⁴_{Jan. Feb.} describes a case of tuberculosis of the œsophagus. Besides the œsophageal trouble the patient suffered from tuberculosis of the lungs, cervical and bronchial glands, pleura, and intestines. The patient's death followed a paracentesis for empyema. On section of the œsophagus, there were found in the anterior wall, somewhat to the left of the middle line, two ulcers, about equal in size and measurements, seven, five, and four millimetres. The more superficial one reached the muscular coat, but did not penetrate beyond; while the other had perforated

the œsophagus, and communicated by a small opening with the left pleural cavity. The edges and bases of the ulcers were smooth. In the ulcers living maggots were found. Tubercl bacilli were found in the tubercles surrounding the ulcers. Letulle⁷, also reports a case.

GENERAL THERAPEUTICS.

Anæsthetics.—W. Wingrave²⁶ Jan. 1 strongly advocates the use of gas in preference to chloroform in throat surgery. He shows that chloroform has been responsible for five deaths in these cases in the past two years,—a calamity which ought not to occur in operations of such short duration. The use of chloroform transforms what is a simple and safe operation into one of considerable danger, and unless its use has any great advantages it ought not to be employed. That a great deal more can be done with the use of gas than is generally believed is well known to those throat surgeons who employ it systematically, if only a moderate degree of rapidity be practiced. Lennox Browne, of London,¹⁵¹ Oct. also strongly advocates the use of nitrous-oxide gas for operations on the throat and nose.

E. B. Gleason, of Philadelphia,¹ Oct. 29, '92 recommends antipyrin as a local application in inflammation of the mucous membrane of the upper respiratory tract. He had used this agent for three years and found that it yielded good results as a local analgesic and anti-spasmodic, whose effects could be maintained for a long time if applied at sufficiently frequent intervals. Furthermore, its use seemed to be followed by permanently beneficial results. Neumann⁶²² No. 3, May 13 obtained good results with 35- to 50-per-cent. solutions employed locally. The more lasting relief which it gives, its innocuousness, and its antiseptic properties recommend it as against cocaine; and it was observed that its effects do not diminish after repeated applications, as is the case with the other drug.

Formanilid is recommended by Preisach¹¹³ No. 10 as an analgesic. Dysphagia, for instance, can be arrested in a few minutes after insufflation, the pain not returning generally before ten hours, although occasionally in a shorter time. Its effects are, therefore, more lasting than those of cocaine. A. Bökiai¹¹³ No. 10 recommends it in painful inflammations, as tonsillitis, pharyngitis, etc. Neumann first found biting and then numbness of the tongue from a 20-per-cent. solution, with pallor and analgesia of the mucous membrane, the effects lasting an hour or an hour and a half.

Regarding operative procedures, Bryson Delavan, of New York,^{Nov. 19, '92} in a study of the influence of certain diathetic conditions upon the prognosis in operations upon the throat, aptly remarks that: 1. Rigid examination as to the possible existence of the hæmorrhagic diathesis should be made prior to operation in every case. 2. In the existence of hæmophilia, operation by any procedure at present known is absolutely contra-indicated. 3. Since many of these cases urgently require relief, it is most desirable that a method of reaching them more satisfactory than any heretofore practiced be suggested.

INTUBATION OF THE LARYNX.

By J. O'DWYER, M.D.,
NEW YORK.

As heretofore, only those articles based on some considerable personal experience with intubation will be referred to in the following review of the literature of this subject for the past year.

One of the most valuable papers, from the statistical standpoint, at least, was that read before the Kings County Medical Society by George McNaughton and William Maddern, of Brooklyn.^{157 Aug.} In order to obtain the largest possible number of cases of both intubation and tracheotomy, circulars containing the following questions were sent to every physician who was known to have had some personal experience with one or both of these operations: "How many tracheotomies have you had? How many recovered? How many intubations have you performed? How many of these recovered?" Out of about 400 circulars sent to physicians in various parts of the United States and Canada, answers to 242 were received, giving an aggregate of 2417 tracheotomies for croup, with 586 recoveries, or 24.2 per cent., and 5546 intubations, with 1691 recoveries, or 30.5 per cent.

The treatment of croup by means of calomel fumigations is also discussed in the same paper. This method of administering mercury in croup was first practiced by Job Corbin, of Brooklyn, many years ago, but received very little attention until within the last few years. After very considerable experience with calomel fumigations in the treatment of croup, I am convinced that it is the most valuable means of medication in this disease that we possess at present, and that it will save a larger percentage of cases without the aid of surgery than any other method of treatment with which I am familiar. It is also capable of doing much harm, and the dosage of from 30 to 60 grains (2 to 4 grammes) at each fumigation, as recommended by the author, is too large. I am in the habit of using from 10 to 20 grains (0.7 to 1.13 grammes), ac-

cording to the size of the tent in which the patient is placed, every two hours during the first day, increasing the interval to three hours on the second day, and so on, according to the progress of the disease. The patient should be left in the tent for fifteen minutes at each sitting, and the flame of the spirit-lamp so regulated that the calomel all evaporates within this time. That the mercury in this form is absorbed by the mucous membrane of the mouth and air-passages is demonstrated by the fact that nurses or attendants who remain much in the same room soon become ptyalized and that older children occasionally show constitutional effects. In order to obtain the best results, the fumigations should be resorted to early, or before the mucous membrane becomes lined with a layer of pseudomembrane. In the fulminant cases that run such a rapid course as to call for surgical relief within twenty-four hours from the initial symptoms, neither this nor any other method of medication will accomplish very much.

L. S. Pilcher,¹⁵⁷ in discussing the preceding paper, while advocating tracheotomy as a greater life-saving operation than intubation, proves the opposite side of the question in the most conclusive manner, as follows: "In this city (Brooklyn), I believe it has been my lot to be called upon to do tracheotomy for the relief of croup in a considerable proportion of the cases that have sought surgical relief, and yet, during the seventeen years during which I have been operating, I have been called upon to do the operation but 66 times, notwithstanding the deaths from croup in our city during this period have amounted to between 400 and 500 every year. On the other hand, during the past four years, McNaughton has been called upon to intubate 142 times. He has been instrumental in saving 42 lives in four years, I but 22 in seventeen years, notwithstanding 33½ per cent. of my cases recovered and but 29.5 of his." In other words, during the seventeen years that Pilcher has been the recognized tracheotomist of Brooklyn, there occurred in that city in the neighborhood of 8000 deaths from croup, yet he was called upon to do tracheotomy only 66 times, or 1 in about every 120 of the fatal cases. It is also significant that most of Pilcher's experience was obtained in the ante-intubation period, when the only alternative was tracheotomy or the most cruel of deaths by slow strangulation; nevertheless, the latter was preferred to the cutting operation. This condition of things was not peculiar

to Brooklyn, but existed in every large city in this country and obviously to a still greater extent in smaller places. It is, therefore, a matter of little practical importance to determine the relative life-saving qualities of these two procedures for the relief of croup, since the poorer class of people, amongst whom this disease principally prevails, seldom tolerate the one, while they rarely object to the other.

F. E. Waxham, of Denver, Col.,⁷² reports 466 cases intubated for croup, with 161 recoveries,—34.5 per cent. Henry Blodget, of Bridgeport, Conn.,²⁰⁰⁴ reports 41 intubations, with 15 recoveries, or 36.5 per cent. E. H. Stevens¹⁵¹ has performed 35 tracheotomies with 10 recoveries, and 30 intubations with 11 recoveries. He has never performed tracheotomy since his first intubation. W. Cheatham and N. B. Pusey¹³⁹ jointly report 126 intubations, with recoveries of 43.6 per cent. Cheatham never uses the extractor, but removes the tube by firm compression of the trachea, and seizes the tube by a forceps when it appears in the pharynx. James B. Ball, of the West London Hospital,⁶ Nov. 20, 1902, reports 22 intubations in children, with 10 recoveries, the stenosis in 2 of the cases being due to traumatism, in the others to croup. In 7 of the cases secondary tracheotomy was resorted to, but all of these died. Bernard Pitts, of London,⁶ Sept. 9 relates some interesting facts regarding laryngeal stenosis due to scalds of the larynx from steam, hot water, etc. From 1872 to 1893, 78 cases of this nature were admitted to St. Thomas's Hospital, almost all of which had some difficulty of respiration, but only 23 came to operation. On 17 of these tracheotomy alone was performed, with 8 recoveries; intubation on 6, with 3 recoveries, and secondary tracheotomy on 3 cases in which intubation gave no relief and all of which died. The same author, in a lecture on intubation,² July 22 gives the results obtained with this operation in a small number of cases treated at the Great Ormond Street Hospital for Children. During the year 1890 intubation was practiced in 11 cases of diphtheritic croup with only 1 recovery, after which the operation was abandoned for two years. It was then resorted to again in the same number of cases, this time with 8 recoveries, or 9 recoveries in 22 cases,—over 40 per cent.,—which is better than the average results obtained when the number of cases is much larger.

Up to the present time, intubation has not had a fair trial in

England. Some of the reasons for this are given in the following quotation from the lecture just referred to: "Intubation for laryngeal diphtheritic stenosis does not seem to make much progress in general favor in England. It is not my intention to go through the oft-repeated arguments as to the respective merits of intubation and tracheotomy, but rather to point out some of the causes which have prevented intubation from a more extensive trial in this country. The treatment of diphtheria, in its surgical aspects, in our hospitals is, for the most part, carried out by the resident staff, and every six months or a year this staff is changed. Students are taught nothing about intubation in most of the textbooks, and, not unnaturally, the operation of tracheotomy, concerning which they have heard and thought a good deal, presents many attractions. 'How many tracheotomies have you done?' is a common question asked of the out-going house-surgeon; and it is generally considered not kind or fair to add, 'and with what result?' . . . When considering the position of intubation in 1890, I could point to 30 cases at St. Thomas's Hospital with 40 per cent. of recoveries. I then stated that from so small a number it was impossible to speak with any confidence, but that this method ought to receive most serious attention, and I maintain still that we are justified in giving an extended trial to intubation in diphtheria."

Bokai³⁶⁶ Jan. 19 gives the results of intubation in a series of 291 cases of croup treated at the Stephanie Children's Hospital in Budapest, Hungary. Of the 291 cases, 100 recovered,—34 per cent. In 212 cases there was pharyngeal diphtheria, and of these 65, or 30.5 per cent., recovered. Secondary tracheotomy was performed in 8 cases, with 1 recovery. In 67 cases there was croupous laryngitis without pharyngeal diphtheria, and in this class there were 32 recoveries, or 47.5 per cent. Secondary tracheotomy was performed three times, with 1 recovery. In 9 cases the croup was secondary to measles, and only 1 of these recovered. In 3 cases it was secondary to scarlet fever, and 2 of these recovered. Bokai recommends intubation as the routine treatment in croup, and believes that tracheotomy should be reserved for two classes of cases: (1) those in which, in addition to the laryngeal stenosis, there is also serious naso-pharyngeal obstruction; (2) those in which there is so much œdema about the upper aperture of the

larynx that no good result can be expected from intubation. From a recent communication I learn that Bokai, since the foregoing report, has increased his number of intubations in round numbers to 500, with recoveries of 36 per cent.

Gustav Baer³³⁶ gives the results of intubation and tracheotomy in the service of W. von Muralt at the Children's Hospital in Zurich from 1874 to 1891. From 1874 to 1888 tracheotomy alone was resorted to, and during this period 533 cases were operated on, with 43.3 per cent. of deaths. During the succeeding three years 157 cases were intubated, with a mortality of only 39 per cent. It is also noted that under 6 years of age tracheotomy gave a mortality of 51.7 per cent., while in those treated by intubation during the same period of life it was only 41.8 per cent. The difference is still more striking in children under 3 years of age, in which tracheotomy gave a mortality of 62.2 per cent. and intubation of 47.7 per cent. In 19 of the intubation cases secondary tracheotomy was performed, with only 1 recovery. In only 2 cases was it necessary to remove the tube by means of the extractor, as the string was always left attached. There were never observed any injuries to the tissues, such as false passages made during the operation, swallowing of the tube or its slipping into the trachea, or asphyxia from plugging of the tube or haemorrhage. One serious accident occurred which was due to pushing down membrane before the tube, with fatal result. Vomiting during the operation happened only once. In 10 cases rather bulky pseudo-membranes were coughed out through the tube.

The remarkable results just quoted, as obtained with both operations, would indicate a milder type of the disease in Switzerland than that which prevails in the United States. It is certain that no such results can be obtained with either operation in an equally large number of cases with the type of disease that prevails in New York City.

S. Schweiger, of Vienna,³⁶⁶ Aug. reports 70 intubations for croup, with 26 recoveries. Secondary tracheotomy was resorted to in 29 cases, with 5 recoveries. Thirty-three primary tracheotomies with 8 recoveries are also given. Schweiger has devised a forceps which serves the double purpose of an introducer and extractor. As an extractor it is certainly no improvement on the original instrument devised for this purpose, and as an introducer its use is not only

dangerous, but cruel. It leaves the distal extremity of the tube open, which of necessity causes severe pain as it passes through the chink of the glottis, besides the injury inflicted on the tissues; and if pseudomembrane be present it is liable to be stripped off and occlude the lumen of the tube before the latter reaches its destination. Very early in the experimental stage of intubation, the absolute necessity for a pilot, or some device by which the lower aperture of the tube could be closed and converted into a blunt probe-point while being inserted, became evident. Any attempt, therefore, to dispense with this important arrangement is going backward over ground that has already been worked.

G. D. Nutt,^{19 Sept.} reports 44 intubations for croup, with 25 recoveries and 19 deaths. He divides the cases into diphtheritic and membranous. Of the former there were 23 cases with 10 recoveries, and of the latter 21 cases with 15 recoveries. Eight of the cases were under 2 years of age, with 2 recoveries. Egidi, of Rome,^{624 Mar.} reports 74 intubations for croup, with 20 per cent. of recoveries; while tracheotomy had previously, in a similar number of cases, yielded 30 per cent. Egidi attributes the poor results obtained with intubation to the fact that most of the intubated cases were under 3 years, while the majority of the tracheotomies were over this age; and also to the prevalence of a more fatal type of diphtheria during the intubation period.

J. Taub,^{169 Sept.} has practiced intubation in two young infants, suffering from whooping-cough, for the relief of severe and frequently-repeated attacks of spasm of the glottis. One of the cases was complicated with broncho-pneumonia at the time. Intubation was resorted to several times in each case, and the tube was left in position from three to five hours on each occasion. All the distressing symptoms were relieved as soon as the tube was inserted, and refreshing sleep usually followed. Both cases recovered completely.

CHRONIC STENOSIS OF THE LARYNX.

W. K. Simpson,^{151 July} in a practical and instructive thesis on intubation in the treatment of non-membranous stenosis of the larynx in the adult, gives a report of five cases that were treated from two to five years prior to the report:—

1. In the first the vestibule of the larynx was filled by a

large, granulating mass, having a cauliflower appearance and completely covering the vocal cords. As it was believed to be of syphilitic origin, the patient was placed on large doses of the iodide of potassium; but before this had much time to take effect intubation was demanded, on account of threatened asphyxia. Complete relief followed the introduction of the tube, which was removed in three and a half days, when the growth was found to have entirely disappeared (probably by sloughing) and the larynx to have regained almost its normal condition. This patient was seen five years later, and there had never been any recurrence of the disease.

2. This case was at first believed to be one of tubercular laryngitis, but the subsequent history and the benefit derived from mercury and the iodide left no doubt that it was at least complicated with syphilis. Laryngeal symptoms, with croupy cough, aphonia, and increasing dyspnœa, began six months prior to first intubation. A great deal of force was required to pass the smallest-sized adult tube through the larynx. It was left in position for six days, and relieved the dyspnœa for nine months. The second time the tube was coughed out in four days, and the stenosis did not recur for two years and three months. The third intubation was two years ago, with no return so far.

3. Chronic syphilitic stenosis of two years' standing; epiglottis partly destroyed by ulceration. Intubation was accompanied by considerable difficulty, owing to the cicatricial nature of the obstruction. The tube was left in the larynx for eighteen days. Over three years later, it is noted that there has been no return of the dyspnœa, but the voice is somewhat hoarse.

4. This was a case of bilateral paralysis of the abductors. The patient was in an extremely exhausted condition, owing to long continuance of the dyspnœa and other causes, when intubation was resorted to. Although complete relief followed the introduction of the tube, the patient never rallied. Death took place, twenty-four hours later, from heart-failure, with symptoms of incipient pneumonia.

5. In this case the stenosis followed fracture of the larynx, for which tracheotomy was first performed. Five months after the accident, intubation was resorted to for the relief of increasing dyspnœa. The tube remained in the larynx six days, and the

relief to the dyspnœa following lasted thirteen months. Intubation was again performed, and the tube was left in position a week, with freedom from dyspnœa up to the present time,—over a year.

A. Rosenberg⁶⁹ _{Aug. 31} reports some experience with intubation for stenosis of the larynx at the University Polyclinic for Throat and Nose, Berlin, service of B. Fränkel:—

1. Hysterical contracture of adductors, attended with severe dyspnœa, in which intubation gave relief. A subsequent attempt to intubate by an inexperienced hand produced a severe subglottic swelling, for which tracheotomy had to be performed.

2. A similar case, in which intubation, practiced daily for five days, resulted in cure.

3. A case of cricoid syphilitic perichondritis, in which tracheotomy was first performed. To get rid of the retained tracheal cannula, Schroetter's tin plugs were first tried, without success. In a relatively short time, by means of intubation, the tracheal cannula was dispensed with.

4. A similar case, in which intubation in the early stage of the disease rendered tracheotomy unnecessary. The patient, who before the operation breathed with great difficulty, now breathes with perfect freedom, but the voice remains somewhat hoarse.

5. Subglottic laryngitis, attended with severe dyspnœa, for the relief of which intubation was practiced. In two days the tube became obstructed and had to be removed, but there was no return of the stenosis.

6. This case was a child suffering from urgent dyspnœa due to multiple papillomata of the larynx. Endolaryngeal operation was proposed, but was considered dangerous on account of reaction that might follow. Intermittent intubation, when life was endangered, gave relief. Each time the tube was inserted several small pieces of the growths were coughed up, which relieved the dyspnœa.

7. A 6-year-old child, also suffering from multiple papillomata of the larynx. After three intubations the dyspnœa was removed and the voice, which before was lost, returned.

8. This was a case of phthisis with perichondritis of the arytenoids and possibly, also, of the cricoid, on whom tracheotomy had been performed. After two intubations the left cord, which

before was fixed in the middle line, became movable. Patient did not return for further treatment.

9. A 4-year-old child, tracheotomized for croup six months previously. Cannula could not be removed without serious attacks of suffocation resulting. Intubation for three days effected a cure.

10. Traumatic stenosis of the larynx, with adhesion of vocal cords in anterior half. Adhesions destroyed with galvano-cautery, and tube inserted to prevent reunion, followed with splendid result.

11. Double posticus-paralysis, with acute subglottic swelling. Intubation was performed because the patient refused tracheotomy. After the tube had been inserted and expelled several times, the patient finally submitted to tracheotomy. (When the vocal cords are paralyzed, especially the adductors, the size of the retaining-swell of the tube must be considerably increased, in order to transfer the retaining power from the cords to the subglottic division of the larynx.)

Gustav Baer,²⁰¹⁷ of the Children's Hospital, Zurich, in addition to the cases of acute stenosis of the larynx already referred to, reports six cases of chronic stenosis in the service of Geiger:—

1. Child, $2\frac{1}{2}$ years old, tracheotomized for croup, in which cannula could not be dispensed with at the end of three weeks; required intubation intermittently for two months to effect a cure.

2. Girl, aged 12 years, wore a tracheal cannula for two hundred and forty-five days; was discharged cured three months after first intubation. Stenosis returned in about eighteen months, which required occasional intubation for six weeks. Case reported well two years later.

3. Girl, 4 years and 9 months old, tracheotomized for croup. Intubation for seventeen days; cured.

4. Girl, aged 18 months, tracheotomized for foreign body in larynx, followed by stenosis at the seat of cicatrix; was cured by intubation in five days.

5. Girl aged 6 years. Stenosis at the seat of tracheal wound; stricture so close that it would admit only a small probe to be passed up into the larynx from below. All the older methods of dilatation were practiced for eighteen months without success. It was permanently dilated by intubation in ten months.

6. Girl, aged 6 years, tracheotomized for croup in 1884, and retracheotomized four times during the next six months. The

stricture in this case, also, was just above the tracheal opening, and very small. The usual methods of dilatation were tried in vain, and no further attempt to get rid of the tracheal cannula was made for six years. The external wound was then enlarged and the cicatricial tissue which encircled the trachea was removed, after which intubation was practiced for a year, with permanent cure. In the later period of the treatment intubation was only necessary once in three or four weeks, and the tube was allowed to remain from one to two days on each occasion. The voice was restored, after having been lost for six years.

Intubation has been resorted to in a number of cases for the relief of dyspnoea resulting from the presence of papillomata in the larynx, and also with the hope that the pressure of the tube might cause the absorption or destruction of these growths. A few successful cases have been reported, but, as a rule, nothing more has been accomplished than relief to the dyspnoea while the tube remained in the larynx, and it would be unreasonable to expect more when the growths are multiple and situated above the vocal cords.

The superior cavity of the larynx is so large and the tissues so yielding, without any solid background, that increasing the size of the head of the tube sufficiently to make the pressure effectual would endanger the integrity of the normal structures. In the inferior cavity, on the contrary, a growth can be compressed between two comparatively unyielding surfaces, that of the tube on one side and the cricoid cartilage on the other, and in this class of cases intubation will prove more successful.

My own experience with intubation in this form of stenosis is confined to a single case of multiple papillomata filling the cavity of the larynx in a child aged 3 years. The head of the tube was coated with gelatin, carrying alum and other astringents, and was removed and recoated several times for over a month without any apparent effect on the growths. Laryngotomy was finally resorted to, and the papillomata removed, but, as so frequently happens in these cases, either from a recurrence or other cause, the cannula could not be dispensed with.

F. E. Waxham⁶¹ _{Oct. 22, 92} reports a most interesting case of retained laryngeal tube, in a boy intubated when $2\frac{1}{2}$ years old for the relief of dyspnoea due to papillomata of the larynx. At the time the

report was made—four years after the first intubation—the boy was 6½ years old, in excellent health, and still wearing the tube, which could only be dispensed with for a few hours at a time. In the early stage of the treatment, chromic acid was applied to the head of the tube by means of gelatin, as already indicated, with the hope of thus destroying the growths, but without success.

During Waxham's absence in Europe, several abortive attempts to remove the tube were made by one not familiar with the operation, and tracheotomy was performed, the tracheal cannula being allowed to remain. On his return he attempted to re-intubate in order to get rid of the tracheal cannula, but found the lumen of the larynx completely obliterated by adhesions above the external opening. The larynx was laid open, the adhesions broken up, and a small intubation tube inserted, while the tracheal cannula was also retained. The most remarkable feature of this case is the fact that both tubes were worn at the same time for two years, the intubation tube alone not affording complete relief, owing to granulation tissue or some of the old growths overlapping the proximal opening. These were finally removed by curetting, and the tracheal cannula was dispensed with.

In the discussion of the foregoing paper, Thrasher reported the case of a boy, 6 years old, from whose larynx he had removed a mass of papillomatous growths with the cutting forceps, after a preliminary tracheotomy, with relief to the dyspnœa, which lasted only two months. They were again removed under cocaine, and recurred in a month. After repeated removals, at intervals of from four to eight weeks, intubation was resorted to, as the breathing was not relieved by the last operation. The tube was coughed out in a month, when a marked atrophy of the growths was noted. A larger tube was then inserted, which was still being worn at last accounts.

Lichtwitz¹¹ has devised a method of removing laryngeal growths in children by means of a fenestrated tube. The fenes-trum is made rather large, occupying about one-third of the circumference of the upper portion of the tube, while the shoulder occupies the other two-thirds. Any growth situated opposite to this opening drops into the tube and is then more easily removed without injury to the normal tissues. Lichtwitz at first used the

Turck-Schroetter forceps for this purpose, but, finding that several introductions were necessary to accomplish the desired result, devised other instruments exactly corresponding to the diameter of the tube, by which any intruding neoplasm could be removed at a single insertion. The results obtained by this method are reported as very satisfactory.

I have devised a fenestrated tube (Fig. 1) for the removal of subglottic growths, particularly applicable to children, but may be used also in adults. The fenestrum, which acts as a snare, extends almost the whole length of the tube, is wide above and gradually tapers to a point below. The lower half is provided with a cutting edge, which is slightly inverted to avoid injury to the healthy tissues. The tube is cylindrical in form and made of very thin metal in order to have as large a cavity as possible for the neoplasm to



FIG. 1.—FENESTRATED TUBE FOR THE REMOVAL OF SUBGLOTTIC GROWTHS. (O'DWYER.)
(Journal of Laryngology.)

drop into. To facilitate its introduction, the lower extremity is cone-shaped and perforated with several small holes to permit of entrance and exit of air, should the operation from any cause be prolonged beyond a few seconds. It is fastened above by a screw which allows it to rotate, so that all parts of the subglottic division of the larynx can be curetted in turn when the position of the growth is not known. It is introduced like the ordinary intubation tube and immediately withdrawn, a little pressure being made toward the side on which the fenestrum is placed. This snare is useless except for growths situated on the free margin of the cords or below. When curetting with the fenestrum looking anteriorly, the epiglottis must be protected by the finger. No other normal tissue can be injured by it. In children the size of the tube should be in proportion to the age, which can be obtained from the retain-

ing-swell of the corresponding croup-tube. About half an inch in diameter would be suitable for adults.

Maydl¹¹ has practiced intubation with a long, flexible tube attached to the tube in the larynx to prevent the admission of blood into the air-passages during operations about the mouth and pharynx, thus obviating the necessity for preliminary tracheotomy. The pharynx was tamponed with iodoform gauze, and respiration and narcosis were carried on through a funnel attached to the long tube outside of the mouth. The long metallic tube (Fig. 2) devised by me to simplify the Fell method of producing artificial respiration in narcotic poisoning is a simpler and more efficient means of accomplishing the same result. The larynx is tamponed by conical tips of different sizes, constructed either of metal, hard

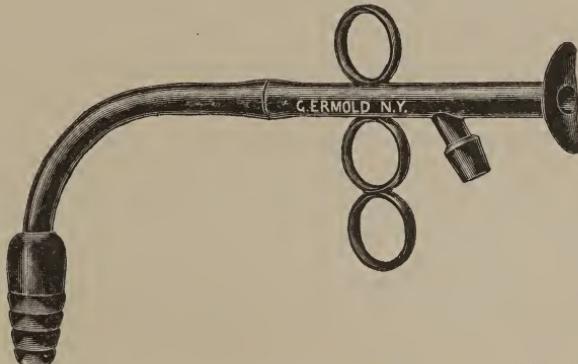


FIG. 2.—TUBE TO PRODUCE ARTIFICIAL RESPIRATION. (O'DWYER.)
(*Journal of Laryngology.*)

or soft rubber, which are provided with a number of circular grooves to facilitate their retention. The method of producing artificial respiration in opium poisoning devised by Geo. E. Fell, of Buffalo, N. Y., and called by him "forcible respiration," consists of a foot-bellows connected with a face-mask or tracheal cannula by means of an elastic tube. The object of the long tube (Fig. 2) is to dispense with the necessity of doing tracheotomy and make a direct channel between the bellows and the lungs through the natural passages, the face-mask connection, for obvious reasons, being unsatisfactory. The conical tips are designed to tampon the subglottic portion of the larynx, which is almost cylindrical, comparatively small and undilatable, and therefore easily plugged; while it is difficult to tampon the vestibule of the larynx on account of

its varying size, or the chink of the glottis owing to its triangular shape. This device has been used a sufficient number of times to demonstrate that no air can escape during forcible inspiration with the bellows, and, consequently, that blood or secretions cannot enter the air-passage from above while in position. The tube is held firmly down in the larynx by three fingers inserted into the rings attached to the handle for that purpose, while the thumb of the same hand is used as a valve to close the proximal opening during forcible inspiration with the bellows.

DISEASES OF THE THYROID GLAND.

BY J. PAYSON CLARK, M.D.,
BOSTON.

ANATOMY.

H. Christiani⁴¹⁰ has found that the lateral accessory thyroid glands in the rat, mouse, and field-mouse never completely fuse with the thyroid. In the rat, although completely imbedded in that gland, they remain separated from it by a layer of connective tissue. In the mouse they are less completely surrounded, and in the field-mouse one glandule is quite separated from, while the other is only in contact with, the thyroid. Chantemesse and René Marie^{14 Mar. 19, '92} describe two groups of glands in man, situated at the point of entrance into the thyroid of the superior and inferior thyroid arteries, thus confirming the description of Sandström. These glands, having the structure of the embryonic thyroid, should not be called accessory thyroids, but rather parathyroids. An intra-capsular operation on the thyroid would leave these glands undisturbed.

GOITRE.

Eiselsberg^{11 Juno} has observed in the bones adenomatous tumors, which must be regarded as metastases of goitre. Ewald^{22 Aug. 9} reports two cases of metastasis of goitre. In the first a hard tumor of the scapula, on removal, was recognized, microscopically, to be an adenocarcinoma of the thyroid. In the second case there was a gelatinous goitre, and also a tumor of bony hardness on the malar bone. Microscopical examination of the latter growth revealed the structure of the foetal thyroid. P. Bruns^{451 July} reports the case of a woman who had always had a small goitre, which, however, in the preceding six months, had begun to grow rapidly. On the supposition that it was malignant, it was removed. Examination showed it to be tubercular, probably primary, as no other organ gave signs of the disease. W. A. Edwards^{451 Apr. '92} reports a

case of acute enlargement of the thyroid gland in chronic parenchymatous nephritis. The enlargement was due to a dropsy of the gland. The serous cavities were free from effusion. The writer is inclined to regard the condition as a vasomotor neurosis in association with Bright's disease. He calls it angioneurotic œdema.

Pathology.—R. M. Horne,^{6 Nov. 26, 1902} in a study of the histology of the vascular system of the thyroid in goitre, has examined twenty-eight glands taken from individuals varying in age from a foetus of the fourth month to an adult of 68 years. Death in these cases was due to a variety of causes. In glands containing goitrous nodules, the writer found arteries in which there were well-marked proliferations of the endothelium in localized areas, forming bud-like projections. In one specimen these proliferations frequently occluded the artery. The groups of cells forming these buds may cause little or no projection of the intima, but may develop outwardly at the expense of the muscular coat. The size of the buds varies much within certain limits. It is probable that enlargement of single endothelial cells indicates the commencement of the process. As buds have been found containing colloid, they would seem to have the power of producing this material. The larger arteries are almost or altogether free from these changes.

Treatment.—Massage of the neck in the case of a young woman, reported by Szuman^{34 Aug. 1}, caused an appreciable reduction in the size of the goitre in a short time. The massage movements were downward and outward, synchronous with deep inspirations. A. Poncet^{14 Mar. 19} describes a new operation for parenchymatous goitre (to which he gives the name exoathyreopexy), first performed by his assistant, Jaboulay. It relieves the symptoms due to pressure of the growth, and brings on atrophy. The goitre was freed from surrounding parts as far as practicable, brought forward through the external wound, dressed antiseptically, and left to atrophy. Although the wound was perfectly aseptic, the temperature was elevated for a few days, due, the writer thinks, to modification in the nutrition of the displaced tumor and the setting free of toxic substances in the circulation. The operation has been performed twice with good results. As to what ultimately becomes of the shrunken remains of the tumor, the writer does not say.

J. Boeckel,^{168 June 1} having performed 34 operations (16 enuclea-

tions, 16 partial thyroidectomies, and 2 total extirpations), decidedly favors enucleation where it is possible. T. Wette¹³ Mar. 15 has made a study of 92 cases of goitre operated on by Riedel. In many cases where dyspnoea was a symptom it could not be referred to compression of the trachea, but was probably due to a reflex action on the respiratory centre through the nerves in connection with the goitre. The larynx shared in the symptoms of goitre 23 times. The most prominent laryngeal symptom was hoarseness, for which nothing was found to account in 12 cases. In 6 cases of total extirpation, severe cachexia occurred twice; not fatal. Of 63 patients with more or less severe dyspnœa, 57 were cured. Of the 92 cases, 3 died.

The following are some of the advantages claimed by J. Wolff¹¹² July for the intra-capsular operation: 1. Wounding of important parts is rendered impossible. 2. The patient is spared, to the greatest possible extent, loss of blood. 3. The operation is easier. 4. Primary ligature of vessels is not often required. 5. Bleeding is controlled by methodical compression of the part of the wound not being directly operated on. This pressure is made by the fingers of assistants or by compresses. The compresses used are moderately tight wood-wool tampons covered with gutta-percha. The operation is done with the head in the hanging position. Wolff⁶⁹ Mar. 16 thinks that sudden death occurring during or immediately after the extirpation of a goitre may be due to asphyxia caused by a collection in the pharynx of mucus coming from the stomach. In one case the writer removed a quantity of this mucus from the pharynx, with immediate relief of the symptoms of suffocation.

R. U. Krönlein¹³ Mar. 15 reports 202 cases of goitre on which he has operated. Of these 11 were malignant, 5 dying as a direct result of the operation. Of the 191 benign cases, nearly two-thirds were women. All cases showed more or less dyspnœa. Total extirpation was done 7 times; partial, 133 times; enucleation, 50 times (46 in cystic cases); intra-capsular *evidement*, once. There were nine deaths. Sudden death in cases of goitre is caused by suffocation due to sudden increase of the pressure of the goitre against the softened tracheal wall. The greater the need of air, the more the contraction of the accessory respiratory muscles press the goitre against the trachea.

EXOPHTHALMIC GOITRE.

Etiology.—Dourdoufi ³¹_{Jan. 28}; ⁹⁰_{Apr.} distinguishes three varieties of this affection: (1) secondary, symptomatic of lesions of corresponding central nerves, and of certain forms of hypertrophy of the thyroid; (2) reflex, following lesions of different organs; (3) idiopathic or essential, due probably to intoxication by a chemical substance. According to the writer, there is a complete analogy between the symptoms of cocaine poisoning and those of Graves's disease. G. Gautier ¹³_{Apr. 15} distinguishes between a true or primary Graves's disease, which he regards as a neurosis of the nerve-centres, and a secondary or symptomatic form, for which he enumerates and discusses the following causes: (1) bulbo-cerebral lesions; (2) thyroid lesions; (3) diseases of nasal fossæ; (4) affections of abdominal organs; (5) affections of genital organs. W. H. Thomson ¹_{June 8} is inclined to believe that a specific disorder of intestinal digestion is a primary factor in the genesis of this affection. He has found diarrhoea to be a prominent symptom in severe cases. Meat diet in one case seemed to be a direct cause of diarrhoea, tremor, and rapid heart-action. Treatment based on this theory gave quite favorable results. T. Wette ⁴¹_{Mar. 23} says that a direct pressure of the goitre on the sympathetic or a reflex action through a disturbance of the nerve-filaments of the sympathetic in the thyroid, causes the exophthalmus and the tachycardia. It is probable that the atypical nervous symptoms are a result of a general intoxication of the body by chemical products formed in the pathological thyroid. R. W. Briggs ³⁶_{Feb.} contends that in this affection the secretion of the thyroid is exaggerated and probably altered; so that it is not unreasonable to suppose that the cures which have resulted from partial excision of the gland have been due to a reduction of the amount of secretion formed. Müller ¹¹²_{Sept.} reports five cases of Graves's disease, with autopsy. He concludes that the development of the disease requires two factors: first, a functional anomaly of the thyroid gland, and, second, a neuropathic condition, either hereditary or developed through fright or trouble.

Symptoms.—E. Berger ¹⁴_{Mar. 15} has observed in two cases an involuntary flow of tears as the first symptom of exophthalmic goitre. Homen ¹¹_{May} mentions two symptoms which have not yet

been described,—intermittent swelling and pains in the joints, and tremor of the eyelids when closed. Rosenblatt⁴¹ Mar. 31 reports a case in which trembling of the limbs was the first symptom. A. Maude⁴⁷ Autumn, Winter, '92 says that the tremor of Graves's disease is most marked in the hands, and may be confined to them. Other muscles most often affected are the pectorals, serratus magnus, and erector spinæ. If the tremor is well marked in any group of muscles, it is sure to be general over the whole body to some degree. Placing the hands on the patient's shoulders when he is standing will detect even very slight tremor. P. Guttmann⁴¹ Feb. 27 has discovered an arterial murmur in the thyroid in Basedow's (Graves's) disease, isochronous with the pulse. Two factors, he believes, cause the sound,—hypertrophy of the left ventricle of the heart and irregular dilatation of the arteries in the thyroid. As the murmur is never absent in this affection, and does not occur in ordinary goitre, it is of especial diagnostic value in doubtful cases.

Treatment.—E. D. Ferguson⁶¹ Aug. 5 has given strophanthus in fifteen or twenty additional cases since his first report (ANNUAL for 1891), with a varied degree of improvement in each case. The dose must be gradually increased until beneficial results are obtained, or there are evidences of injurious effects. The writer has never been obliged to cease its use on account of toxic symptoms. Some cases are obliged to continue the drug the greater portion of the time. Rotter²² Jan. 18 removed the right (larger) half of the struma in a case. Improvement began almost immediately, and at the end of four months was marked. At that time the thyroid was still somewhat enlarged, and there was some exophthalmus. J. J. Putnam¹ Aug. 12 reports the case of a young woman in which the right lobe and most of the isthmus were removed. Her condition was decidedly better at the end of six months, although she was not cured. The remaining portion of the tumor had not shrunk. Neumann⁴¹ Jan. 19 reports the removal of all but a small portion of the goitre in one case, with resulting relief of all the symptoms and an apparent cure of the disease. J. Wolff⁶⁹ Mar. 16 has performed unilateral extirpation in five cases with improvement in all. One of the cases had a severe recurrence two years after the operation. Reviewing his results, he feels that he has no cause to be enthusiastic over operative interference in this affection. However, the fact remains

that immediately after the operation there was observed a most striking retrogression of all symptoms of the disease. Bottini³³⁶_{Aug. 19} reports a case in which total extirpation of the thyroid was performed. The patient was perfectly well ten months later. There had been no sign of cachexia strumipriva. G. Gautier¹³_{Apr. 15} says that, from the point of view of prognosis and treatment, it is important to distinguish the secondary from the primary variety. The primary, arising from dynamic trouble of nervous centres, is very rebellious, while the secondary variety often yields readily to treatment, if the lesion or modification of the organ to which it is due is susceptible of amelioration.

MYXOEDEMA AND CACHEXIA THYREOPRIVA.

Etiology.—Zanda⁵⁷_{July 23} finds, from a series of experiments, that thyroidectomy can be performed on dogs without any evil result, provided the spleen has been removed at least a month before. He concludes from this that the cause of cachexia thyreopriva is a collection in the blood of a toxic principle, apparently a product of tissue change sent into the blood by the spleen, which toxic principle is neutralized by the thyroid.

Pathology.—R. M. Buchanan²¹³_{Nov. '92} has found a condition of the thyroid in a case of myxoedema which may be described as cirrhosis. Marie¹⁴_{Feb.} has observed a persistence of the thymus in myxoedematous idiocy, the thyroid being absent or pathologically altered. In myxoedema in the adult the thymus may become revivified. This condition of the thymus has been found in acromegaly and in several cases of exophthalmic goitre. Godart and Slosse⁸⁶⁸_{July 1} have been unable to clearly establish, from a series of carefully-conducted experiments, the existence of hypertoxicity in the urine of thyroidectomized dogs. They attribute the uncertainty of their results to an inherent defect in their method of experimentation. R. Boyce and C. F. Beadles⁹⁰_{Dec. '92} report two cases of myxoedema and one of cretinism in which the hypophysis cerebri was found to be enlarged. In the first two the thyroid was atrophied, and in the third there was no trace of a thyroid. There was an increase of colloid material in the hypophysis.

Symptoms.—Buzdygan,²⁹⁷_{Feb. 4} in frequent examinations of the gastric juice in two cases of myxoedema, found that in one case mucin was secreted three-quarters of an hour after the normally

completed digestive act, while in the other case it could only be found in the morning, in the fasting stomach. G. R. Murray²_{Sept. 23} suggests that the anaemia of this affection is due to the loss of the thyroid secretion, which, in some way, either stimulates the formation of the red corpuscles or prevents their destruction, the thyroid gland being only indirectly concerned in their formation. R. Kirk⁶_{Sept. 23} mentions the importance of looking for signs of myxoedema in cases of intractable uterine haemorrhage without apparent cause. He reports two cases showing the beneficial effects of pregnancy on the disease. Clouston²_{Aug. 20} reports on the mental symptoms in nine cases sent to an asylum on account of insanity. The mental symptoms varied widely, embracing simple and suicidal melancholia and various forms of mania. All the cases began with slowness of mental action and lethargy. There was generally an acute period, succeeded by a condition closely resembling a mild dementia with delusions. E. Gley⁴¹⁰_{July} has discovered that in certain conditions not determined there may develop in thyroidec-tomized rabbits a special cachexia comparable to myxoedema in man. Eiselsberg⁶_{Oct. 22, '92} extirpated the thyroid in two lambs. Eight months later they showed a marked retardation in growth, especially in weight, as compared with a control animal. There were, besides, enlargement of the occiput, defective development of the hind parts of the body, swelling of the abdomen, lowering of the temperature, etc. The intelligence was diminished.

Treatment.—During the past year a large number of cases of myxoedema have been reported which have shown marked improvement or have been apparently cured by the administration of the thyroid (generally of the sheep) either subcutaneously, in the form of a fluid extract, or by the mouth. In the latter case it has been given raw, mixed with other food or drink, partially cooked, desiccated, or as an extract. It has been clearly shown that the thyroid secretion of some healthy animal (sheep, pig, or cow) can carry on the functions which were performed by the normal thyroid secretion before the gland was affected. It has also been observed that the improved condition of a patient can be maintained only by a continued use of the remedy probably for the rest of life. G. R. Murray⁶_{May 18} divides the treatment into two stages: (1) removing the symptoms of the disease; (2) maintaining the condition of health attained. The first stage must be car-

ried on gradually, and with care, as the alteration in the patient's condition is so great that, in many cases, it is not safe to bring it about rapidly. This caution applies especially to cases which show signs of cardiac or vascular degeneration. Two such patients died of syncope brought on by overexertion, after the symptoms of myxœdema had been much improved. Ten to 15 minims (0.65 to 1 gramme) of the extract (see ANNUAL for 1892), twice or thrice a week, may be slowly injected. If flushing of the face or pain in the lumbar region occur, the injection should be stopped. For administration by the mouth, the solution is made without carbolic acid. When taken by the mouth from the beginning, daily doses of 5 to 15 minims (0.32 to 1 gramme) two or three hours after breakfast have been found best. The changes which take place in the temperature, pulse, weight, appearance, and sensations of the patient are all important in governing the dose. In the second stage, the smallest dose which keeps the temperature up to the normal, or above 97° F. (36.1° C.), is sufficient. The remedy is given preferably by the mouth in this stage. H. W. G. Mackenzie⁶⁸ says one-half to one thyroid gland, twice a week, is sufficient in commencing treatment. Too great increase in the pulse-rate and vomiting are signs that the patient is getting too much. F. Vermehren⁶⁸ reports two deaths under treatment of patients with weak heart. B. Bramwell¹⁵ says that the dose should be much smaller in such cases than the usual one. Complete rest in the recumbent position should be enforced from the commencement of the treatment. Some of the discomforts of treatment, as mentioned by G. Stewart¹⁵ are a feeling of tightness in the chest, with itching, burning, and other abnormal sensations in the skin, and a sense of weakness. J. J. Putnam⁵ says that loss of weight is an early sign of improvement, which sometimes goes beyond the requirements of health. Rise of temperature and pulse, increase of urine, faintness, headache, prostration, cardiac weakness, and neuralgic pains have been observed during treatment. Symptoms following administration by the mouth are, according to J. L. Porteous,⁷¹ less unpleasant than those following subcutaneous injection, although improvement under the latter method is, as a rule, more rapid. W. M. Ord and E. White² placed a myxœdema patient on a diet ordered so that its different elements should be, as far as possible, the same each day.

At the end of a week treatment with thyroid extract was begun, the diet remaining the same. During treatment the urine was increased in volume; the nitrogen excreted in the urine exceeded the total quantity of nitrogen in the food, and appeared in the urine chiefly in the form of urea. Phosphoric acid and chlorine elimination was practically unaffected. The body-weight was diminished rapidly and the temperature raised. Mental improvement in myxœdematous patients under the thyroid treatment has generally been as marked as the physical.

A. Napier⁶ found that over 50 per cent. of sheep's thyroids examined by him showed more or less evident indications of deviation from the normal. This fact emphasizes the need of care in the selection of glands for administration. Space will not permit of more than a brief mention of some of the many methods of preparing thyroids reported. E. White² makes a glycerin extract with some modifications from G. R. Murray's formula. He has also² obtained the active extract in a dry state, 3 grains (0.2 gramme) of the powder corresponding to an eighth of a gland. Crary¹⁰⁷⁷ describes a method for preparing a sterile glycerin extract. J. J. Putnam⁵ has used thyroids in the form of powder prepared by Parke, Davis & Co. at his suggestion. V. Horsley² suggests treatment by feeding or injection before transplanting a thyroid, so that the grafted gland may be imbedded in normal connective tissue. Kocher⁹ reports five cases of cachexia strumipriva successfully treated with thyroid extract. McKenna,¹¹³⁴ gives a brief account of a case of myxœdema treated by desiccated thyroids. The patient had been suffering from the disease for two years, and had taken all the usual remedies—jaborandi, iron, arsenic, strychnia, etc.—without any permanent benefit. McKenna administered 7 grains (0.45 gramme) three times a day, and an improvement was visible within a few days after this treatment was instituted. The change in her appearance was most marked, the face becoming normal and losing its mask-like expression.

H. Bronner, of Bradford, England, ² described the case of a married woman, aged 46, who had been ailing for six years. She complained of coldness and "swollen" feelings. She was short, broad, and stout; face pale and expressionless, eyes seeming wider apart than usual, hair thin and dry, eyelids swollen, speech slow and deliberate, skin dry, hands broad and spade-like, tem-

perature subnormal. Treated with thyroid tabloids, two thrice daily. She was markedly better at the end of a month. The temperature had risen, and the weight had fallen from 172 pounds to 151 pounds.

A. Poncet ²¹¹_{June 25} reports the case of a girl with myxœdema and mental perversion upon whom he performed the following operation (which he calls *thyroïdo-érethisme*): An incision was made in the median line of the neck. The thyroid, which was small, was denuded with the finger, elevated, and powdered with iodoform. Five weeks later the improvement in mental and physical condition was remarkable. The object of the operation was to stimulate the gland by manual irritation, and by antiseptic dressings directly in contact with it.

CRETINISM.

J. Thomson ²_{Sept. 23} reports three cases of sporadic cretinism much improved by thyroid feeding. In the youngest, aged 5 years, the growth of the skeleton was greatly accelerated. The other two, aged 18 and 22, who had not grown for fourteen and seventeen years respectively, grew rapidly for several months. Other writers report cases showing improvement from this treatment.

LEGAL MEDICINE AND TOXICOLOGY.

By FRANK WINTHROP DRAPER, A.M., M.D.,
BOSTON.

LEGAL RESPONSIBILITY FOR REFUSING TO SUMMON MEDICAL ASSISTANCE.

Lorenzo D. Bulette, of the Philadelphia bar,⁴⁵¹ June calls attention to the "numerous instances of the death of persons due to the neglect or refusal, either of the patient himself or of those in charge of him, to call in skilled medical attendance." Such cases, when arising from conscientious scruples of a religious nature, present certain legal difficulties not always met by the common law: *e.g.*, in England, a child, 14 months of age, died from acute inflammation of the lungs. The parents realized that he was very ill, and supposed the illness to be due to teething. Being members of a sect called "Peculiar People," they, in accordance with the views of this sect, acted upon the letter of the text of the general epistle of St. James, chapter x, verses 14 and 15, anointed the child with oil and trusted to prayer, without seeking medical advice. On their trial for manslaughter they were acquitted. Following this trial, Parliament at once passed a statute enacting that "when any parent shall willfully neglect, among other things, to provide medical aid for his child, being in his custody, under the age of 14 years, whereby the health of such child shall have been, or shall be likely to be, seriously injured, he shall be liable to summary conviction," etc.²⁰¹⁹ Under this statute a father was convicted of manslaughter, in a somewhat similar case, shortly afterward. The case was appealed, but Chief-Judge Coleridge, in delivering the opinion of the court, held that the conviction should be affirmed, the case being covered by the statute above referred to: "The law permits the utmost latitude for the indulgence of religious belief, yet when that belief, reduced to practice, seriously endangers the well-being of the people, it becomes a violation of that supreme law which is the welfare of the people,

and in the presence of which other laws must yield." Regarding contagious diseases, statutes have already been framed, which protect the public to some extent. In the absence of a special statute applicable to non-contagious diseases, declaring it an indictable offense, on the part of parents or others, to neglect to provide medical attention for those in their care, the common law is insufficient to convict of criminal neglect, providing the parent has exercised his best judgment, however perverted. The power to rectify this defect in our laws rests with the Legislature. The enactment of such statutes as the British one above referred to would have a salutary effect in correcting the abuses incident to perverted beliefs.

MEDICAL EXPERT TESTIMONY.

Gray¹ considers that some method of improving the present relations of the medical witness is greatly to be desired. At present he stands in a false position. Judge, lawyers, and jurymen regard him as a partisan. Too often his personal address, his coolness, and his adroitness, rather than any exposition of the facts of science offered by him, are all that impress a jury, untrained in the consideration of weighty problems and acquainted with medical knowledge only through the garbled gleanings of a sensational press. Questions of law are discussed only with those qualified to discuss them. They are brought not to the jury, but to the judge. If not answered to the lawyer's satisfaction, he may appeal to still higher judicial hearers. Not so with the questions which the medical expert is obliged to discuss in court. The history of our courts records many failures of justice in determining medical questions under the present system. Men have been hanged as sane when experts have testified to their insanity, and post-mortem examinations have proven the correctness of their testimony. Property has been unjustly conveyed under similar perversions of truth. Gray suggests two methods of rectifying this defect: First, the selection of medical men by the presiding judge to sit on the bench with him in an advisory capacity in trials which do not need juries; second, a conference of all the medical men in cases tried by a jury. Such a plan is not without precedents which have given general satisfaction. In the English admiralty courts retired naval officers are selected by the judge to advise him. These offi-

cers are called assessors and sit with the judge on the bench. Indeed, in jury-trials in England it has for some time been the custom to have conferences of medical experts. Sir James Fitzjames Stephen says^{2018 ss}: "For many years this course has been pursued by all the most eminent physicians and surgeons in Leeds, and the result is that in trials at Leeds (where actions for injuries and railway accidents and the like are very common) the medical witnesses are hardly ever cross-examined at all, and it is by no means uncommon for them to be called on one side only. Such a practice, of course, implies a high standard of honor and professional knowledge on the part of the witnesses employed to give evidence; but this is a matter for medical men. If they steadily refuse to act as counsel, and insist on knowing what is to be said on both sides before they testify, they need not fear cross-examination." Such conferences of medical men were suggested four years ago by the Hon. Willard Bartlett, and have been carried out successfully in a number of cases tried before him. There is a popular feeling that medicine is an uncertain science. In point of fact, there should be no essential disagreement among educated physicians. Differences of opinion may exist, but even then the reasonable certainty aimed at in law can best be reached by a conference of qualified physicians. Medicine has, to a great degree, emerged from the period of empiricism into one of approximate certainty. This fact has not yet been grasped either by the laity or the legal profession, who are slow to comprehend the great scope of modern medicine, and the lengthy and special training required for the mastery of any one of its departments. In view of these changes incident to modern civilization, our laws should be changed to meet them.

SIGNS OF DEATH AND POST-MORTEM APPEARANCES.

Value of the Diaphanous Test.—Haward^{6 June 10} records a case in which, while most of the tests were confirmatory, two of them gave the same results as if life were not extinct. The patient presented a life-like appearance, and, though she had ceased breathing, the friends were greatly alarmed lest she be buried alive. They had the greater reason for anxiety because she had once before fallen into what seemed a similar condition. Sir Benjamin Ward Richardson was summoned in consultation and made tests, with the following results: 1. Heart sounds and motion entirely ab-

sent, together with all pulse movement. 2. Respiratory sounds and movement entirely absent. 3. Temperature of the body, taken in the mouth, the same as that of the surrounding air in the room, 62° F. (16.7° C.) 4. A bright needle plunged into the body of the biceps muscle (Cloquet's needle-test) and left there showed, on withdrawal, no sign of oxidation. 5. Intermittent electric shocks at various tensions, by means of needles passed into various muscles and groups of muscles gave no indication whatever of irritability. 6. The fillet-test (Richardson's test) applied to the veins of the arm caused no filling of veins on the distal side of the fillet. 7. Opening of a vein showed the blood to be still fluid. 8. The subcutaneous injection of ammonia (Monteverdi's test) caused the dirty-brown stain indicative of dissolution. 9. On making careful movements of the joints of the extremities, the lower jaw, and the occipito-frontalis, rigor mortis was found in several parts. 10. On holding the hands up to the light of a strong reflector lamp (the diaphanous test), the appearance between the fingers was as distinctly scarlet as in health. This anomalous condition was due to the fluid character of the blood, as observed by test 7. All the other tests but these were confirmatory of death, but, to be doubly certain, the room was heated, when decomposition set in by the next day. It is thus seen that the diaphanous test, if alone relied upon, might give rise to error. It may show, in life, the absence of color, as observed by Richardson in the case of a lady who fainted.

A Sign of Stillbirth.—Moreno² states that an infallible method of determining whether a dead infant has breathed or not is to note whether the alveoli contain cubical or flat epithelial cells. Before the alveoli are filled with air, the cells of the ultimate bronchioles, which correspond to the ciliated epithelium cells of the respiratory tract elsewhere, are cubical; afterward they become flattened. He considers this flattening a physiological process, but does not make it clear that it is not largely a mechanical one.

WOUNDS.

Wounds without Injury to Overlying Clothing.—The possibility of wounds occurring from external violence, yet without injury to overlying clothing, receives additional support from the

following cases: Wagner¹ reports that once while hunting he fell and drove the corner of a small hatchet, which he was carrying, violently against his thigh. As he found no cut in his trousers he concluded he was only bruised, but soon found that he was bleeding from a lacerated wound about an inch long. The clothing had been driven ahead of the hatchet. Spokes⁶ attended a man in whom the right testicle was found protruding from a clean-cut scrotal wound. The history was that while leading a horse he fell and was trodden on. The corduroy trousers were found to be uninjured. Within the pocket was a purse having a metal border and clasp. The pocket was also intact. Though the injury appeared incredible from such a source, self-mutilation being strongly suggested, yet corroborative evidence showed that the wound was due to the violent driving of the purse against the genitals without injury to the overlying clothing.

Strangulation of an Adult, with Extensive Fracture of the Larynx.—The possibility of extensive injury of internal parts from violence, without corresponding injury of external parts, receives confirmation from a case of unusual interest reported by Stevenson and Carling.⁶ The patient, a man 42 years of age, was garrotted, and was found dying about twenty minutes after having been seen, immediately previous to the assault. The only external evidence of violence at the seat of injury consisted of an inconspicuous, semilunar mark, on a level with the cricoid and a little to the right of the median line, as if from the pressure of a collar-button or a finger-nail. A post-mortem examination, forty-eight hours after death, showed much dark blood effused amongst the tissues and muscles of the neck, reaching as high as the hyoid bone and as low as the top of the sternum. The effusion was around the larynx and trachea, but was more extensive on the right than on the left side of the neck. The hyoid bone was broken on the right side, just external to the lesser cornu. The thyroid cartilage was found fractured in three separate places. The line of rupture of the largest of these fractures ran a little obliquely downward from the V-shaped notch in front to the lower border of the cartilage, a quarter of an inch to the right of the median line. Both the superior cornua had been broken off, the one on the right being distinctly separated. The fragment from the left cornu was much larger and its line of fracture more exten-

sive, although its displacement was not so great as that of the right cornu. The cricoid cartilage had been completely snapped five-eighths of an inch to the right of the median line. The broken ends of the cartilage overlapped, the posterior one resting on the anterior. The typical picture of strangulation lesions described by Tardieu was present in this case, such as a peculiar leaden and ashy hue of the countenance, evidences of an intense hypostatic congestion, ecchymoses of the scalp and forehead, gray patches of emphysema in the lungs, etc.

Homicidal strangulation of an adult is of rare occurrence in London, and but one similar case of fractured larynx, met with in a dissecting-room subject, had been seen at Guy's Hospital.

SUICIDE.

The Prevention of Suicide in the Insane.—Sutherland⁶ states that at least one-third of all insane patients committed to English asylums have suicidal tendencies, and that of these only about one in two hundred and twenty-one succeed in committing suicide. He attributes this relatively small number to constant vigilance and care on the part of asylum officers and attendants. Among the precautions especially to be taken are the following: Medicines, plasters, disinfectants, and the like should be sedulously guarded from the patients, and be administered personally by the attendant; keys, and all dangerous instruments, as knives, forks, and edged tools, should be banished or used under the closest supervision; friends should not be permitted to give such articles to patients. As a large proportion of suicides are by hanging, especial watchfulness is needed regarding objects such as nails, wires, ropes, sash-lines, tapes, and strings. Patients are often exceedingly clever in devising unexpected ways for suicide. One patient, for example, tied a slate-pencil to a handkerchief, then thrust that end through a key-hole, made a noose with the other, and succeeded in strangling himself. Another attempted suicide by crowding a billiard-ball down his throat. Patients will swallow almost anything, even pieces of towel and sleeve-links. No suicidal patient should be employed in occupations requiring the use of edged tools; nor should such patients be permitted in fields with working parties, on account of the danger from farm-implements. Places with ready access to ponds, rivers, wells, or railways should

be avoided. Great care should be exercised regarding lights, fires, and windows. The patient should be watched at meal-times not only to see that enough is eaten, but that the food itself be not a source of danger. Concealment of food or table-utensils is a common aim. Great ingenuity is often shown among the insane in converting apparently harmless objects into dangerous instruments, and careful supervision is, therefore, necessary.

Such close attention is rarely to be secured in a patient's home, and suicidal cases should be committed early to an asylum. Physicians should always ascertain and state to asylum officers whether suicidal impulses exist in their patients, and should encourage their confinement until full recovery.

UNRUPTURED HYMEN.

The following difficult and embarrassing case was reported by Prouvost¹⁶⁴ _{Apr. 27}: A girl, 22 years of age, of respectable family, was brought to him for consultation. She had had children's diseases. Her catamenia were established at the age of 14 and continued regularly for a few months, after which they were suppressed and irregular for varying intervals. From 16 to 20 years she was hysterical and became fleshy. She was anaemic, dyspeptic, and constipated. Her abdomen was fleshy, and on it were found rosy striae, such as follow child-bearing. They appeared recent, but her physician stated that they had been present for six years. He attributed them to excessive distension from constipation and flatus. The linea alba presented no trace of pigmentation; the breasts were moderately enlarged; the areolæ were darkened. The uterus was larger than normal; the cervix presented a distinct laceration with a patulous os; the vagina was capacious; the hymen was intact and of the annular variety; it admitted a Cusco speculum. The girl positively denied the possibility of past pregnancy, and her parents as strongly denied operative measures.

In considering the diagnosis, the possibility of meteorism having caused the abdominal striae was to be noted; also, that a fibroma might have been delivered vaginally, the instruments causing the cervical laceration. Such a growth would account for the metrorrhagia and irregularity from which the girl had suffered since the age of 16 years. It appeared clear that the laceration was due to traumatism of some kind. It was noteworthy that the hysteria

and stoutness also dated from about the sixteenth year. Pregnancy would explain the case, but such a diagnosis was rendered doubtful not merely by the positive statements to the contrary and by the belief of her medical adviser that it was to be excluded, but also by the presence of an intact hymen. Tardieu, Hoffman, and Vibert have shown that such a condition may be consistent with childbirth. It is possible that, as the Cusco speculum could be introduced without causing laceration, a foetus, especially if soft and small, might also pass the vulvar orifice without injuring the hymen.

ABORTION.

Vibert²⁴_{Feb. 20} reported to the Société de Médecine Légale of Paris that he had examined seventy-two women on whom one or more abortions had been performed by a woman named Thomas. The medico-legal interest in these cases consists in the manner in which the abortions were performed and their effect upon the women. The facts became known partly from the statements of the woman at her trial and partly from the declarations of her victims. With one hand, and unaided by a speculum, she was accustomed to introduce into the cervix the nozzle of an ordinary vaginal syringe, and to inject water containing an infusion of some herb. This is a difficult proceeding, and if the cervix be to any degree devious, it is hard to understand how an intra-uterine injection could be given in this way; while at the same time, even under favorable conditions, it appears to be a useless measure. Nevertheless, in many instances abortion followed, though repeated trials were sometimes necessary. Presumably, the woman understood the anatomy of the parts. There was no local pain, but the disturbance of the nervous system was sometimes most profound, in one instance even causing death. This patient was four months pregnant, and became violently ill immediately on the introduction of the syringe and before any injection was made, lost consciousness, and died in a few minutes. At the autopsy the membranes were found to be intact and the uterus uninjured. Such a result, in a strong woman, can only be explained by an intense reflex disturbance of the nervous equilibrium. The woman was at the time in a state of great excitement regarding her condition, had just eaten an unusually hearty breakfast, and the heat

of a close, ill-smelling room no doubt was an additional factor in the fatal result. In five other cases, during or shortly after the injection, such symptoms as faintness, dizziness, and vomiting occurred, lasting several hours and disappearing without leaving any trace. In nine-tenths of the cases, however, there was no especial disturbance, and, as the method of procedure was always the same, the untoward effects observed in a few cases must be attributed to an unusual nervous susceptibility. Abortion usually resulted in the course of a day, sometimes in six or eight hours. In only four or five cases was fever present, or the patients obliged to remain in bed for several days. In twenty-five cases, however, there was evident endometritis, which proportion would evidence some relation with the operation. It is extraordinary that no septic troubles arose, as no especial care was taken either of the syringe or the solution used.

INFANTICIDE.

Cazeneuve²¹¹ _{Dec. 4, '92} reports the case of a healthy infant who died suddenly when 5 months old. Seven months later, suspicions of a criminal death having arisen, the body was exhumed, and in the midst of a putrid mass in the abdomen a number of rounded bodies the size of beans were found. Though much decomposed, they were identified as sponge by incineration and by microscopic examination. Arsenic and other poisonous metals were absent. Tests for vegetable alkaloids were not made. The conclusion was reached that death was caused by the criminal administration of some seven or eight bits of sponge in milk, that these swelled in the intestines and caused stoppage, resulting in vomiting, convulsions, and death. Dogs and cats have been killed in a similar way. The author considers his case unique in the history of medical jurisprudence, but calls attention to the fact that infanticide has been caused in England from suffocation by a piece of sponge, the latter, with a string fastened, having been thrust down the infant's throat. The culprit in Cazeneuve's case was sentenced to hard labor for life.

DETERMINATION OF SIZE BY MEASUREMENTS OF THE FEMUR.

Rahon²⁰²⁰ _{'92; Jan. 14}³¹ summarizes the current views as to the relation of the length of bones to the size of individuals,—a matter which, besides being of anthropological interest, may at times prove of

medico-legal value as well. Orfila, Humphry, Rollet, and others have shown that certain relations do exist, but that they differ according to the age and sex of the individual, and also according to the prone or erect positions. Using the tables of Manouvrier, in studying museum specimens, Rahon concludes that we are degenerate forms of gigantic prehistoric ancestors. This conclusion is not accepted by others; moreover, inferences drawn from individual specimens are wholly unreliable in determining the average size of a race, as these individual specimens may have been above or under the average size. They do not always hold good, even for the individual, since circumstances, as illness in the growing period, may have materially modified the normal relations.

Manouvrier has shown that special tables are necessary for each race. In negroes, for example, the leg-bones are longer in relation to the size of the body than in the case with the white race. It is said that in certain marsh tribes of the Upper Nile the natives have legs so long that they serve well as stilts, and that their owners can sleep standing like storks. Without crediting this last statement, it may well be admitted that the lower limbs in certain people may acquire an excessive length.

TOXICOLOGY.

Ptomaines.—Farquharson,¹⁰⁷³ in calling attention to the grave responsibility attaching to expert testimony, to the importance of noting "the slightest deviation or departure from characteristic reaction," and of guarding against every possible source of error or fallacy, points out that, since Selmi's time, our knowledge of ptomaines has greatly increased, and that coincident with it has sprung up the danger, already proven real by one notorious criminal, of having these deadly alkaloids become weapons of crime. He regards the following points to be established. 1. Ptomaines are in every way comparable to the vegetable alkaloids. 2. No reliable test distinguishing them as a group from the vegetable alkaloids has ever been discovered. 3. Any one of the known ptomaines may easily be mistaken for, and identified as, a vegetable alkaloid. 4. They invariably accompany the decomposition or putrefaction of corpses and albuminous material. 5. Ptomaines begin to form in corpses about twenty-four hours after death, normally occurring, and have been found, even in adipocerous corpses,

two years after death. 6. Any one ptomaine developed in a cadaver is formed only to be replaced by another, and frequently of greater toxicity than its predecessor. 7. On the other hand, ptomaines may be the direct cause of death by their introduction into the body in tainted or putrid foods. 8. In such cases the symptoms and mode of death may be easily mistaken for poisoning by a vegetable alkaloid or for simple gastro-enteritis. 9. Again, in these cases ptomaines might be detected as vegetable alkaloids in the stomach contents, and the vomit and post-mortem features may be corroborative. 10. It is very possible that in such cases, where the opportunity of detecting a powerful poison exists, according as circumstantial or collateral evidences present themselves, suspicion of murderous intent may or may not be attached to any person or persons.

Delphinine is closely simulated by a ptomaine. In 1870 the servant of General Gibbon was accused of having caused his death by that alkaloid; but Selmi, in an exhaustive analysis, showed that it presented essential points of difference. Coniine also has a near relative in the products of cadaveric decomposition. It is so poisonous that 7 milligrammes ($\frac{1}{9}$ grain) injected into a frog will cause instant death. In the Krebs-Brande case, at Braunschweig, in 1874, this alkaloid was found even in *undecomposed* parts of the body. Selmi concluded that it was an oxidation product of certain fixed ptomaines, or else one formed by the action of amido bases on volatile fatty acids.

Even morphine has its animal homologue, which was mistaken for it in the Sonzogna trial at Cremona. Though alike in many particulars, yet certain of them differ in special reactions. The ptomaine like morphine resembles morphine in reducing iodic acid and in its method of extraction, and differs from it in its physiological properties and the ferric-chloride test. The ptomaine similar to strychnine resembles that drug in color-test with sulphuric acid and bichromate of potassium; differs from it in taste and does not produce tetanic convulsions when injected. Tamba has found similar relations between ptomaines and nicotine, veratrine, and colchicine. He also asserts, though his conclusions are not widely accepted, that morphia, strychnia, etc., may be so altered in the presence of the unstable ptomaines that their usual chemical reactions may be considerably modified.

While, fortunately, this class of poisons has not yet become an important weapon of crime, yet another aspect assumed is of considerable medico-legal interest, and presents a question not yet fully answered, viz., Where should responsibility be placed and justice administered in the case of poisoning from ptomaines developed in canned goods? Though quite consistent with the provisions of the food and drug act to hold the retailer responsible, yet it would be eminently unfair. Considering how numerous such cases are becoming and the extent of the industries involved, it is surprising that more has not been written on the subject, and it might be well to add to existing legislation, relative to the selection and preservation of food-supplies, acts especially appropriate to the prevention of ptomaine formation.

Aconite.—Though death takes place in aconite poisoning from much smaller doses than are here reported, it has long been noted that recovery may follow the ingestion of considerable quantities. Such recoveries are usually thought to be due either to weak preparations of the drug or, more commonly, to its early ejection from the system. The following cases are instructive in relation to these points:—

Case I. Reported by Smith. ² May 27 A woman, 40 years of age, took about 1 drachm (4 grammes) of Flemming's tincture,—six times as strong as the officinal tincture (B. P.). Emetics were administered within five minutes, and repeated frequently. Four tumblerfuls of warm water were also given. The symptoms were intense,—a burning sensation in the praecordial and epigastric regions, a feeling of suffocation, and, later, numbness of the face and hands, with tingling sensation. The physical signs were pallor of the face, staring appearance, and undue glistening of the eyes. The pupils reacted to light, and were normal in size. The pulse was full,—80. Within half an hour it became irregular and fell to 60. The trunk and extremities became cold. Treatment, apart from emesis, consisted in tincture of belladonna, 10 minims (0.65 gramme) every two hours. Warmth returned in two hours, the tingling and numbness disappeared within four hours, tranquil sleep came on in ten hours, and all symptoms had passed away in a little more than twelve hours.

Case II. Reported by Hardman. ² June 24 A woman, 24 years of age, took about 30 minims (2 grammes) of aconite liniment (B. P.),

—equal to 600 minims (39 grammes) of officinal tincture (B. P.). In ten minutes symptoms appeared of tingling and numbness in hands, fingers, lips, tongue, and cheek, with a sensation of the parts being “drawn up.” After an hour these symptoms were intensified and had extended to the legs and feet, while there was a sense of weakness as of approaching unconsciousness. There was no elimination by the skin, kidneys, or bowels. On attempting to stand, the woman fell and became insensible. She was found unconscious and icy cold, the face very pale, lips blue, eyelids half open, and eyes twitching. Emesis was induced in two hours by salt and water and later by sulphate of zinc. Animal charcoal was freely given, but nothing else with the exception of brandy. Sleep came on in seven or eight hours, and but for a slight sensation of tingling the patient felt well.

Case III. Reported by Altenloh.¹ A woman, aged 30 years, took 4 drachms (16 grammes) of the fluid extract, with suicidal intent. Burning and pain in the stomach, weakness, and restlessness ensued. Twenty minutes after taking the poison she had a profuse discharge from the bowels. The skin was cold and clammy; there was a feeling of numbness, sense of swelling in tongue and throat, convulsive twitching of muscles of face and neck; dimness of sight, with widely-dilated pupils. Emetics were given hypodermatically, without result; also atropia. The symptoms rapidly grew worse. The patient foamed at the mouth and could not swallow. Lock-jaw, deafness, and loss of sight followed; the breathing was slow and regular, the pulse imperceptible, the hands clenched. Tincture of belladonna was then given, with *eau sédative* (Raspail's) internally and externally by rubbing. Improvement took place, but was interrupted by violent pains referred to the heart. This was relieved by rubbing, which was kept up for four hours. Within five hours from the time when the poison was taken she was feeling quite well, but greatly exhausted. Numbness persisted during the following day, and there was also slight vomiting—for the first time—with slight fever and headache.

Antipyrin.—Guttmann¹¹⁶ Oct., '92; Nov. 26, '92² points out a resemblance which antipyrin poisoning may bear to the algid stage of cholera. In a case of his he found severe collapse, cold extremities, vomiting, hoarse voice, and sunken eyes. The stools, however, were solid, and there was a deep, rose-red rash on the patient's body.

His radial pulse could not be felt. He answered questions slowly, complained of headache and noises in his ears, and had disturbed vision. He had taken 10 grammes ($2\frac{1}{2}$ drachms) of antipyrin in 1-gramme ($15\frac{1}{2}$ grains) doses twice daily. The patient recovered under the use of stimulants.

Arsenic.—Murray⁶ _{Oct. 22, '92} reports a case confirming the preservative action of arsenic, and presenting other points of exceptional medico-legal interest. The body of a woman was found in a box consigned from Patua City to Howrah. The police were attracted to it by the odor and the escape of fluid through the joints of the box. Decomposition had set in throughout the superficial parts of the body. In the post-mortem examination the following points were especially noteworthy: (1) the unusual degree of preservation of the interior of the body, as contrasted with the external decomposition, owing to the antiseptic action of the arsenic; (2) the remarkable absence of foul odor on opening the abdomen and alimentary tract (from the same cause); (3) the extreme congestion of the peritoneum, stomach, and entire intestinal canal; (4) the bright-yellow, odorless fluid contained in the intestines, and the small mineral particles floating in it, at once suggesting yellow arsenic in suspension; (5) the deposit of yellow sulphide of arsenic on the endocardium, as reported by Warden. The appearance of the chest-walls, lungs, and air-passages suggested that the murderer had attempted to stifle his victim's cries by strangulation.

Jolly⁶⁹ _{Feb. 2; Feb. 25} relates the case of a woman, aged 27, in whom disturbances of sensation appeared in the hands and feet about five days after arsenic had been taken suicidally. The gastro-intestinal symptoms had subsided. By the fourth week she was unable to walk. A week later there was atrophy, absence of patellar reflex, and reaction of degeneration in some of the affected muscles. Falling out of the hair and increased sweat secretion were also noted. There were no bladder, rectal, or bulbar symptoms. Later, she began to improve. A somewhat similar, but less marked, case is recorded by Bernhardt,² _{Feb. 2} in which gastro-intestinal symptoms persisted for forty-eight hours. In six days the patient, a woman aged 36, had numbness and, later, weakness and heaviness in the legs; also, distinct muscular atrophy, some ataxy, and diminished electrical reactions. Improvement followed in a month. In another case, reported by Gumprecht,² _{Feb. 2} of a young man aged 20,

death resulted in a few hours, from collapse. The urine had been found to contain one-fifth albumen, casts, abundant epithelium, but no blood. Post-mortem examination showed gastro-enteritis and a slightly fatty liver. The kidneys were of medium size, the cortex yellowish-gray in color, and cloudy-looking. In the medulla there was dilatation of the tubules and flattening of the epithelium.

Carbonic Oxide.—Saint-Martin¹⁴ _{Feb. 15} summarizes his conclusions from experiments on animals poisoned with CO, as follows: 1. Rabbits partially under the influence of the gas, placed in conditions in which natural elimination is impossible, slowly but regularly destroy a certain quantity of the toxic gas. This destruction is the more active the less profound the narcosis, and, consequently, sets free in the blood more available oxygen. 2. In order to estimate the amount of CO capable of rendering a confined atmosphere deadly, it is necessary to note the time during which the mixed gas is breathed. According to Grehant, in trials of not more than one hour, 15 to 16 cubic centimetres of CO to a litre of air will kill the rabbit. In Saint-Martin's experiments much smaller doses were fatal if a longer time to act were allowed. This fact aids in explaining the frequent cases occurring at night, where slow-combustion stoves are in use. At night-time, when a man is sleeping, he is less resistant, and, consequently, a smaller dose of CO than is commonly supposed, if breathed for a long time, would prove fatal.

An unusual case of coal-gas poisoning is reported by Templeman.² _{Feb. 14} A family of four adults lived in a ground-floor room of a brick house directly under which a two-inch gas-pipe had burst. The ground outside was frozen hard at the time, and, owing to the warmth of the house and the lack of obstacle in the cellar-floor, the gas was drawn up into the room. Early in the evening a man, on looking in the window, saw the occupants lying about the room as if intoxicated. He noticed an odor of gas at the time. They were not seen again till twenty hours later, when the neighbors broke into the house and found two of the party dead in bed and the other two unconscious and moaning, one in bed and the other on the floor. Both were comatose, with cold extremities and imperceptible pulses. Both had much-contracted pupils. One of these, a man, lived ten hours and the other, a woman, twenty-seven hours after removal to a hospital. The odor of gas was very strong in the house, yet not enough had escaped to form an explosive

mixture (about 10 per cent.), as a paraffin-lamp had been burning the whole time without having ignited the gas. An autopsy on the body of the woman, made thirty-six hours after death, showed a large quantity of fluid under the arachnoid membrane and also in the lateral ventricles. The substance of the brain was deeply congested. The lungs were engorged with dark, thick blood and contained very little air. There was a decolorized blood-clot in the right side of the heart; the left side was empty.

Broadbent², May 13, reports the case of a man, aged 43, who "had slept all night in a small, unventilated room, with the gas turned on." He was unconscious, with flushed face, lips red, pupils unaffected; there was some rigidity of both arms and legs. Being unable to swallow, he was fed by a tube. Oxygen inhalations were given without effect. Twelve ounces (373 grammes) of blood were removed by venesection, a normal saline enema administered, and the next day 12 ounces (373 grammes) of defibrinated human blood were transfused. Slight improvement followed. Tr. ferri perchlor., m xv (1 gramme), and liq. arsenici hydrochlor., m iv (0.26 gramme), were given t. i. d., and the bowels were kept well open. His condition improved after the second day, and he began to notice people up to the tenth day, when he relapsed and grew steadily weaker, with extreme muscular wasting. Profuse sweating and involuntary discharges from the bowels and bladder persisted from the first. He died after an illness of nineteen days. His wife, who slept in the same room with him, recovered within a week.

Chloral.—The antidotal effects of heat, coffee, etc., in chloral poisoning are well shown in the following cases: Snell², Oct. 15, 1902, reports the case of a woman who had taken, with suicidal intent, 4 ounces (124 grammes) of syrup of chloral (B. P.). Extreme torpor, cold and livid extremities, moist face, stertorous respiration, feeble and irregular pulse, contraction and fixation of the pupils were found three hours after taking the dose. Ordinary stimulation, such as ammonia, flagellation, etc., produced no effect. Liq. strychninæ, m iv (0.26 gramme), was given subcutaneously, and repeated five times within the next hour. A quart (litre) of hot, strong coffee was given by enema; also, later, by the mouth. Hot water (temp. 105° F.—40.6° C.) was copiously used in washing out the stomach, and hot applications were made to the extremities. The first sign of response appeared in about five hours (*i.e.*, just

after the fifth dose of strychnia), but not till after seven hours was sensibility really established so that the patient would respond to the frequent flagellation with wet towels, etc. She could swallow in thirteen hours, continued semicomatose for another twelve, and answered questions sensibly in thirty hours after taking the poison.

Holburton^{2 Nov. 12, '92} records another case in which recovery followed after a large dose of chloral. The patient, a young man, had taken suicidally 3 ounces (93 grammes) of syrup of chloral (B. P.). He was found in the morning unconscious, with cold, clammy, and livid body, stertorous respiration, small and quick pulse, and dilated pupils. The treatment consisted of an hypodermatic injection of apomorphine, gr. $\frac{1}{10}$ (0.008 gramme), which was followed immediately by profuse vomiting; the injection of a pint ($\frac{1}{2}$ litre) of hot strong coffee, heaters, and flagellation. After two hours of treatment he could answer "yes" and "no," and could swallow hot coffee. He continued to improve, and in twelve hours more, though somewhat dazed, had practically recovered.

Iodine.—Bellot^{31 Feb. 8} reports a case, under the care of Robin, of poisoning by tincture of iodine, which, though conforming, for the most part, to the symptoms given by Dragendorff and others, is worthy of note on account of the rarity of cases of poisoning by iodine or its preparations. A woman, aged 26, took, with suicidal intent, a half-glass of the tincture. She immediately became nauseated, and had a sense of severe burning in the pharynx and œsophagus. Copious draughts of water (a litre—quart—in all) calmed this without inducing vomiting, which, however, came on in the course of an hour, when a dark, thick, very bitter fluid and, finally, clear blood were ejected. Three or four hours after taking the poison the patient suffered with abdominal pains. In five hours she complained of dizziness, and in seven hours she had an attack of syncope. (She had eaten nothing for thirty-three hours.)

Treatment consisted chiefly of milk and starch-water. The first night was sleepless. The following morning she had moderate epigastric tenderness on pressure, and a sense of burning in the stomach, which disappeared in a couple of days. The urine was normal, and gave no trace of iodine. This was the case, also, with the sweat, saliva, and nasal mucus, though usually elimination takes place through these channels. In this case the effect was that of a local irritant, except that the gastro-intestinal mucous

membrane appeared to offer a greater resistance to its action. The comparative absence of sensory disturbance was also noteworthy.

Naphthol.—Jacobson³⁷³_{p.765} reports the case of a cord-maker who swallowed 100 grammes ($3\frac{1}{4}$ ounces) of Martin's or Manchester yellow, and died after four hours. There was dilatation of the pupils and intense yellow coloring of the skin, the mucous membranes, and even the hair. Neither the examination of the blood during life-time nor the autopsy revealed pathological changes. Manchester yellow is the ammonium salt of dimitro-a-naphthol, and has not hitherto been used as a poison. (Report of Corr. Editor Levison, Copenhagen.)

Phosphorus.—It is held that in phosphorous poisoning a patient is safe if jaundice does not supervene within a few days, or at most within two or three weeks. Rare instances are noted by Blyth of its delay for eighteen and in one case for twenty-seven days. The following case, under the care of West,⁶_{Feb. 4} shows that even a longer period may intervene before the development of fatal hepatic symptoms. The patient, a woman aged 52, had eaten rat-poison (phosphorus-paste and paraffin-oil, the size of a walnut). Within fifteen minutes she felt numbness in the legs, burning in the mouth and stomach, and pain in the abdomen. Sulphate of zinc produced free emesis. In the next hour four doses of turpentine, each mxl (2.6 grammes), were given, followed by opium and bismuth. In a day, except for nausea, she was practically well, and in twelve days left the hospital. Four weeks later she returned, being very ill, with deep jaundice, vomiting (nearly black), pains in the head, back, and legs. The liver was tender and enlarged. She died in six days after the jaundice came on. The autopsy showed the liver to be enlarged, firm, heavy, of a pale-yellow color, and markedly fatty, with cells completely degenerated and converted into a fine granular detritus, amidst which the nuclei could hardly be detected, and which refused to stain with haematoxylin. It may be added that there was no reason to believe that any fresh dose of phosphorus had been taken subsequently to that for which she was under treatment six weeks before her death.

Prussic Acid.—Taylor²_{Nov. 26, '92} describes the appearance of the body of a man who had been poisoned with hydrocyanic acid, these appearances differing somewhat from those commonly observed. The attitude was suggestive of sleep, the body being

comfortably tucked up in bed. The only rigidity was about the jaws, which were firmly clenched. There was no froth on the lips. The eyes, with pupils only moderately dilated, looked life-like. Lividity had appeared in spots, especially in the fingers and dependent portions of the body, though the trunk was still warm, and it had assumed a deep-violet color. The odor of the acid was not perceptible until the body was opened, when it became strong. No unusual appearances existed in the organs except some venous congestion, and, in the stomach, a slightly-increased vascularity.

Potassium Chlorate.—Ignatieff read a paper before the Society of Physicians of Moscow³¹ _{Jun. 28} on a case of poisoning by chlorate of potash. The patient, a man 36 years old, had taken a coffeespoonful of this salt. Soon afterward he developed cyanosis of the lips, tongue, and fingers; also renal pain, excessive vomiting, and jaundice. On the second day the abdominal symptoms were intensified and included severe pain in the liver, but neither the liver nor the spleen was then increased in size. The urine contained red and white blood-corpuscles. On the third day the vomiting was less frequent. The spleen became enlarged. The blood showed an alteration in the red globules and a slight leucocytosis, also a band of methaemoglobin, with the spectroscope. The temperature fell from 37.8° C. (99.2° F.) of the first day to 35.8° C. (96.5° F.). Numbness of the upper extremities came on and he died on the evening of the third day. The autopsy showed moderate jaundice, cyanosis, and pallor of the lungs, with oedema of the lower lobes. The heart contained liquid blood. The spleen, liver, and kidneys were enlarged, and contained free, partially-disintegrated blood-cells in their glandular portions. The kidneys also showed evidence of interstitial inflammation, and the spleen of small capsular haemorrhages. There was nothing of note found among the nerve-ganglia of the heart or intestines.

Quinine.—Grosskopf¹¹⁶ _{Oct. 92; Dec. 17, 92}² reports the case of a man who took 2.5 grammes (38½ grains) of quinine for malaria. In an hour he became unconscious, pallid, with cold surface. The pulse and respirations were feeble and rapid. Camphor and ether injections aroused him in another hour, but he could not see. He then slept for eight or nine hours. On awakening his sight still troubled him, but he recovered from this rapidly and went to work the next day. He complained of no tinnitus or deafness at any time. The malaria did not return.

Strychnia.—Henry⁶ Mar. 25 reports the case of a man, aged 46, who took, by estimate, from 7 to 10 grains (0.45 to 0.65 grammes) of strychnia. Symptoms came on within ten minutes, and were typical. He was seen about fifty minutes after taking the poison. Chloral and bromide were freely administered, and were supplemented by occasional inhalations of chloroform. The stomach was then thoroughly washed out with warm water. In another hour all the symptoms were intensified, and chloroform was given more freely, resulting in a state of quiet for two hours. By the fifth hour twitchings and mild convulsions returned. An hour later he was moved to a neighboring hospital without causing convulsions. By the seventh hour the convulsions became more marked. They occurred in sudden paroxysms, going off as rapidly as they appeared and leaving the patient very weak. In one of these paroxysms he became asphyxiated, and died eight hours and three-quarters after the ingestion of the poison. It was noteworthy that he had prepared himself for quick absorption, as he had refrained from breakfasting that morning. As the duration of such cases has not previously been reported as exceeding six hours, this case is instructive, as guarding physicians from giving a favorable prognosis too early; also, as showing the need of unremitting care, even when a case seems to be improving.

A number of cases of strychnia poisoning have been reported during the past year in which the value of the treatment by chloroform is apparent. Certain cases have been saved by its judicious use, and in certain other cases it appears that if the anæsthetic had been continued longer fatal results might have been prevented. Bock⁸⁶⁸ Feb. 12 reports the case of a man, aged 21, who, thinking he was taking dosimetric granules of caffeine, took 19 granules, each containing 1 milligramme ($\frac{1}{64}$ grain) of arseniate of strychnia. Contractions about his throat, a quarter of an hour later, showed him his mistake. Convulsions with extreme opisthotonus soon followed. The pupils were much dilated and irresponsive to light or touch. Asphyxia was threatened. An injection of 3 centigrammes ($\frac{1}{2}$ grain) of the acetate of morphine was given; also, chloroform by inhalation. These soon controlled the convulsions. On omitting the chloroform an accession of symptoms occurred, so that it was practically given continuously for fifteen hours. At the end of this time the patient was doing well. He had slept twice and was

wholly rational. Fifteen centigrammes ($2\frac{1}{4}$ grains) of acetate of morphine had been given and 150 grammes ($4\frac{3}{4}$ ounces) of chloroform administered. On sipping some water, however, he had a violent convulsion. After this he slept, but had several attacks during the following day and night. Morphine was continued, and 10 grammes ($2\frac{1}{2}$ drachms) of bromide of potassium were added to each dose. On the next day there were slight convulsions, lasting two or three minutes, the last occurring forty-eight hours after the poison was taken. The patient stated that he was conscious throughout, had realized his condition, and had feared death from asphyxia. At each spasm he had had extreme pain, and even the puncture of the hypodermatic needle was intensely painful. Chloroform gave him great relief, being followed by an interval of sleep each time. On the fourth day he had terrifying hallucinations of sight and hearing, lasting only a day. His pupils remained dilated and became sensitive to light, for which nitrate of pilocarpine was given. Hyperæsthesia of the skin and muscles persisted, and a sciatica of the right side developed, so severe as to prevent walking. By the fifth day the patient was quite well.

The writer calls especial attention to the following points:

1. The danger of patients procuring large doses of active drugs without a physician's prescription.
2. Whereas, 3 centigrammes ($\frac{1}{2}$ grain) are usually considered as the fatal dose, a smaller dose may result fatally, as in this case, where such a result was apparently prevented only by prompt treatment.
3. After evacuating the stomach the most important step is to give chloroform, continuously, if need be, until danger is past, as it relaxes muscular spasm, which is the source of gravest danger by producing spasm of the respiratory muscles to the extent of causing fatal asphyxia.
4. The symptoms in this case indicate that, of the nervous reflex centres, those most affected by the drug were the sensory. The extreme pain, the hyperæsthesia, the hallucinations, and other symptoms referable to organs of special sense, as the eye and ear, which are terminations of sensory nerves, also the sciatica, indicate this.

A case reported by Harley,^{6,14} though resulting fatally, emphasizes even more strongly the importance of using chloroform until all danger has passed. Two young women had both been given, homicidally, about 6 grains (0.39 gramme) each of strychnine,

nia. One died, on the way to the hospital, half an hour afterward. The other lived for five hours and a half. The symptoms were of the usual character,—marked convulsions, rigidity, opisthotonus, and imminent danger from asphyxiation, with hyperæsthesia, etc. Forty grains (2.60 grammes) of sulphate of zinc were administered without effect. The stomach was then washed out several times with tepid water, and a tumblerful of thick charcoal and water was given to drink. Chloroform was administered at intervals, with most satisfactory results, but was discontinued in an interval while the patient appeared safe. Three severe convulsions soon supervened, fatal asphyxiation occurring in the last, though artificial respiration and the further use of chloroform were resorted to. The urine drawn by catheter one-half hour before death, owing to retention, contained $\frac{1}{2}$ grain (0.005 gramme) of strychnia. The importance of continuing treatment until elimination is wholly secured is strikingly shown by the following comparative analyses of the organs of the patients:—

E. F. (lived five and one-half hours):

Vomit contained	1.46 gr. (0.092 gramme)	strychnia.
Stomach and contents contained . . .	1.60 gr. (0.108 gramme)	"
Liver and kidney contained	0.20 gr. (0.013 gramme)	"
Total,	3.26 gr. (0.216 gramme)	"

A. M. (died on way to hospital, but had taken the same dose):

Stomach and contents contained . . .	6.39 gr. (0.401 gramme)	strychnia.
Liver and kidney contained	0.40 gr. (0.024 gramme)	"
Total,	6.79 gr. (0.425 gramme)	"

This case also presented another problem of medico-legal interest in relation to the question of obtaining a dying declaration. Whether a medical attendant is justified in telling a patient he is dying is sometimes a very delicate matter, requiring special judgment. Any description of the murderer or other statement concerning the crime cannot be brought as evidence against a prisoner unless it can be proved that the victim, at the time of giving it, believed that he was actually dying. In this case the writer did not feel that he was justified in so telling the patient; therefore her statements were not allowed as evidence at the trial.

A remarkable case of repeated homicides with strychnia is reported ⁶ Oct. 29, 1892: On October 21, 1892, Thomas Neill was convicted of the willful murder of Matilda Clover. The indictment also

included three other counts, charging similar murders of "unfortunate women," with strychnia; two counts for having sent blackmailing letters to Dr. Broadbent and Mr. Joseph Harper, demanding money and charging them with these murders; and one count for attempted murder of Louisa Harvey. Counsel for the defense objected to the admission of testimony relative to other victims during the consideration of the Clover case; but Mr. Justice Hawkins held that "if the evidence was corroborative it ought to be received."

The convict was 41 years old; received a medical education; became an abortionist; and poisoned a man with strychnia, for which he was sentenced for life; but the sentence was commuted to seventeen years, of which he served ten. He returned to England on his release, in 1891, and immediately resumed his career of lust and homicide. Four similar homicides and another attempted one are known to have occurred, and the poisoner tried to implicate his *fiancée* in blackmailing schemes regarding them. The murders might have gone unsuspected had not the poisoner himself given the clue to their discovery. In the Clover case, the medical attendant believed that the woman had died from "delirium tremens and syncope"; but shortly afterward the murderer began making inquiries as to whether she were dead, and a month later charged Dr. Broadbent with having poisoned her with strychnia, and demanded money. Poisoning had not been suspected up to that time. Chemical examination, six months after death, confirmed it. He also tried to levy blackmail on Mr. Harvey on the same account, and charged him with the death of the other women. At the trial one of the women whom he supposed dead was an important witness, as she testified to the fact of his having given her pills to remove some spots from her face, which she discreetly had not taken. Similar pills were found in the convict's room.

In commenting on the case, the writer calls attention to the unjustifiable certificate of death from "delirium tremens and syncope" in a patient having convulsions, yet who had been rational throughout, and who had been about as usual within a few hours of death; also to the prolonged survival (nearly six hours), and to the fact that strychnine could be so readily detected nearly seven months after burial.

Zinc.—Interesting experiments on the toxic action of oxide of zinc on dogs are reported by d'Amore, Falcone, and Maramaldi. ¹⁴ Nov. 16, '02. Fifty centigrammes ($7\frac{1}{4}$ grains) were given by the mouth daily, and produced frequent easy vomiting, great weakness, partial loss of sensation, and marked emaciation. The urine was diminished, stained with blood-pigment, and contained albumen and sugar. There was considerable destruction of the red blood-globules and relative increase in the number of the white. Zinc could be detected in the blood and urine. The dogs lived only from ten to fifteen days. Post-mortem examinations showed extreme pallor everywhere. The liver, kidneys, and pancreas were somewhat similarly affected, there being disseminated areas of fatty degeneration, accompanied by more or less vascular or interstitial disturbances. The intestines were markedly anæmic; in the stomach and duodenum there were spots of hyperæmia, due, doubtless, to local irritation. The chief cerebro-spinal lesions were atrophy of the cells of the anterior cornua, with some swelling of the nuclei. The glycosuria, noted ante-mortem (17 grammes— $4\frac{1}{4}$ drachms—to the litre), apparently bore an intimate relation to the lesions in the pancreas.

Toxicology in Sweden from 1873 to 1892.—Lindberger²⁰²⁷ states that there were reported 1890 deaths which had been subject to medico-legal examination: 1319 were caused by inorganic and 380 by organic poisons; 405 were from arsenic and 743 from phosphoric substances, the former having decreased during the twenty years. In a few cases the presence of free phosphorus was demonstrated. The number of cases of poisoning by carbonic oxide was 55; by hydrocyanide of potash, 51; by mineral acids, 36; by bichromate of potassium, 16; by mercury, 4; by carbonate of barium, 3; by alcohol, 273; by opium, 20; by morphia, 19; by strychnia, 16; by veratria, 3; by carbolic acid, 19; by chloral hydrate, 14; by chloroform, 3; by nitro-benzol, 6; by undefined poisons, 193. In cases of phosphoric poisoning attention should be particularly directed to the contents of the colon and rectum. (Report of Corr. Editor Levison, Copenhagen.)

MEDICAL DEMOGRAPHY.

By F. LEVISON, M.D.,
COPENHAGEN.

GENERAL STATISTICAL CONSIDERATIONS.

THE population of France is still diminishing; according to the latest records there were, in 1891, an average of 989 births for 1000 deaths, the population of that year being 33,343,192. The death-rate was, as in the preceding year, high; especially in the southeast and the west. Of the 876,882 deaths, 453,085 were males and 423,797 females; 866,377 births were registered, making the excess of deaths over 10,000, the general rate of mortality being 22.6 per 1000. There were 285,458 marriages and 5752 divorces. Compared with the statistics of 1890, there is an increase of 16,126 marriages, 295 divorces, 28,318 births, and 377 deaths; that is to say, while the number of deaths has remained virtually constant, the marriages have increased 6 per cent. and the births 3.37 per cent.

Lagneau ¹⁰_{July 18} has collected interesting statistics concerning the city of Paris. Contrary to what is found to be the case elsewhere, the number of adults in Paris greatly exceeds that of children; the married and unmarried are in about equal proportion, 938,046 and 970,715; and while in the whole of France the birth-rate is 23.69 per 1000 inhabitants, in the capital it is 25.02. The number of legitimate children per family, in France generally, is 2.84, but in Paris it is only 1.93; in France 20 families out of every 100 have no children or none living, while in Paris the ratio is 32.3 per cent.; the number of illegitimate children born in Paris is 27.58 per cent., while in the whole of France it is 8.5 per cent. Of 60,000 births annually in Paris, 20,000 are sent out to nurse in the provinces, of whom 38 per cent. die in the first year, against 22 per cent. of the 40,000 remaining in Paris. Diarrhoea carries off 3500 children annually, diphtheria 1400 to 2300, measles 1000 to 2090, and typhoid fever 500 to 2400. Phthisis caused in

1891 10,737 deaths, and all tuberculous diseases 12,430 deaths, or about one-fourth of the total mortality; in London the mortality by phthisis is only 202.18 per 100,000 inhabitants, while in Paris it is 450; in Vienna it reaches 577. The average duration of life in Paris is 28 years, as against 40 years in the provinces. Alcoholism is becoming very prevalent, and Lagneau proposes not only to forbid the sale of adulterated spirits, but also to increase the duties on the licenses of the 29,583 drink-shops of Paris.

Camus ²⁴³_{May, June} and Carlier ²⁴³_{July} have given detailed and interesting reports on the medical topography of the cities of Briançon and Evreux. The annual summary of births and deaths in 1892, published by the Registrar-General of England, contains the following comparative table of the births and deaths in several large towns:

Towns.	Births per 1000 inhabitants.	Deaths per 1000 inhabitants.	Towns.	Births per 1000 inhabitants.	Deaths per 1000 inhabitants.
Christiansia	21.1	19.3	Munich	35.3	26.0
Edinburgh	27.1	19.4	Calcutta	—	27.0
Berlin	28.8	19.6	Budapest	34.8	27.9
Amsterdam	33.8	20.0	Dublin	27.8	29.3
Copenhagen	30.1	20.0	Triest	30.3	30.0
Stockholm	28.9	20.3	Bombay	18.7	32.4
London.	30.9	20.6	Moscow	35.4	36.9
Brussels	26.8	20.8	Hamburg	36.0	39.7
Rome	26.6	21.2	Alexandria	46.2	41.3
Paris	25.0	22.4	Madras	36.9	46.0
New York	—	24.2	Cairo	55.0	47.0
Vienna	31.9	24.3			

Reid ²_{May 29} has presented a report which proves the lamentable results of the employment of mothers in factories, thus depriving the children of their natural food. In manufacturing towns, where a large number of married women are employed in factories, the infant death-rate is 28 per cent. higher than in other manufacturing towns in the county, the death-rate in the former being 195 per 1000 births as compared with 152 in the latter. An inquiry on the same subject instituted by a Parliamentary Bills Committee, and bearing on 100 towns with a population of 3,500,000, gave the result that the increase in the infant mortality attributable to the employment of married women in factories amounted to 21 per cent., the respective infant death-rate being 179 and 152 in these classes of towns.

The census of Ireland for 1891 ¹⁶_{Mar.} gives the information that the population in 1891, including the navy and military service in

that country, was 4,704,750. In 1881 it was 5,174,836. There was, therefore, in ten years a decrease of 470,086 persons, or 9.08 per cent. There was a diminution of 15.7 in the number of children under 15 years in 1891, compared with 1881. While the native-born Irish are thus rapidly diminishing in number, both British and foreign residents in Ireland show a marked increase. In 1881 the number of English-born persons in Ireland amounted to 69,382; in 1891, the number was 74,523. The number of Scotch in Ireland in 1881 was 22,328; in 1891, 27,323. The number of foreigners in 1881 was 11,210; in 1891, 12,900; which increase is partly due to the immigration of Russian Jews during the latter part of the decade.

Longstaff^{22 July 6} has continued his inquiries on the subject of rural depopulation in England, and arrives at the conclusion that no general depopulation has taken place; the population as a whole has increased slowly, but in many localities it is actually diminishing. This local depopulation is due to different causes, as shown by the author in citations from the census of England, Scotland, and Wales. In Ireland many causes have been at work to effect the retrograde movement of the population. Longstaff has further collected evidence from the statistics of France, Spain, Italy, Switzerland, Norway, Germany, Austria, Hungary, Canada, and from the Northern and old-settled States of the American Union, that everywhere there are signs of some diminution of the rural population, which is not only being drafted to recruit the armies of urban industry, but is also emigrating to new and suitable land. But though rural depopulation is very general, its extent has been greatly exaggerated, and even where most prevalent it only amounts to a thinning-out of the people, and may be viewed with reasonable equanimity.

The population of Italy^{996 July 25} is rapidly increasing, although the death-rate of newborn infants is higher. In 1872 the population was 26,967,000, and in 1891 30,347,291. The average number of children, including still-born, in every household, is 4.80, and 7.07 per cent. of the children born in 1891 were illegitimate. Of 100 legitimate children 18 die in the first year, while of illegitimate 25 die. The mortality is 26.21 per 1000 inhabitants.

The Belgian army consisted, in 1891,^{243 May} of 43,784 soldiers; 42,846 suffered from various diseases, necessitating rest for two or

three days; 20,459 (473 per 1000) were treated in hospitals, and 275, or 6.35 per 1000, died. The most prevalent diseases were typhoid fever, with 325 cases and 61 deaths (1.49 per 1000, as compared with 1.31 per 1000 in France); tuberculosis, 321 cases and 49 deaths; pneumonia, 214 cases and 22 deaths; 1394 soldiers suffered from venereal diseases (32 per 1000): of these, 6 per 1000 had syphilis, 1.5 venereal ulcers, and 24 gonorrhœa.

Brussels⁵² had, on January 1, 1892, 180,147 inhabitants; in the year 1892 there were 4739 births, of which 3472 were legitimate and 1267 illegitimate. The number of deaths was 4411, the prevailing causes being bronchitis and pneumonia, 798; pulmonary tuberculosis, 519; enteritis and diarrhoea, 418.

Billings¹¹⁰ states that the mortality in the United States of America is about 18 per 1000, but, as there is no general system of registration, only an approximate estimate can be given. In the cities the death-rate of the colored people is 34.52, while that of the whites is 23.22. In the rural districts of the Southern States, where the relative proportion of the colored population is greatest, the death-rate of the whites is 15–16, and that of the colored 18–20 per 1000. The following table, taken from the census compendium, shows the death-rate in some of the principal cities during the census year:—

Cities.	White.	Colored.	Cities.	White.	Colored.
New York	28.47	37.46	Rochester	17.39	6.92
Chicago	21.03	23.30	Providence	21.97	34.81
Philadelphia	22.28	32.43	Indianapolis	17.78	30.04
Brooklyn	25.41	34.99	Allegheny	20.06	24.13
St. Louis	18.15	34.65	Albany	25.34	39.44
Boston	24.62	33.29	Syracuse	19.74	11.53
Baltimore	22.61	36.41	Worcester	19.14	15.37
San Francisco	23.57	24.06	Richmond	22.25	40.80
Cincinnati	21.93	33.04	New Haven	20.90	29.17
Cleveland	21.83	31.63	Nashville	14.39	23.92
Washington	19.79	38.22	Atlanta	18.28	33.57
Buffalo	19.83	34.22	Memphis	23.37	29.97
New Orleans	25.41	36.61	Charleston	24.75	53.94
Pittsburgh	21.56	29.16	Savannah	29.04	41.47
Louisville	19.66	31.98	Mobile	26.05	43.75

It is chiefly among infants and young children that the excessive death-rates occur in the colored race, in some localities one-half of the colored children dying before the age of 5 years. Although in cities the chances of the negro baby's living one year

are only half as good as those of the white baby, in the rural districts the chances are about equal.

For the year ending June 1, 1890, the death-rate in Massachusetts was about 20.2; Connecticut, 19.4; New Hampshire, 18.8; Vermont, 16.4; Rhode Island, 22; New York, 21; New Jersey, 21.5; Delaware, 18.5 per 1000. The investigation of the causes of death showed that, of 100 deaths occurring in a year, only 2 are due to old age; 17 per cent. are infants under 1 year, and 30 per cent. children under 5 years old. About 25 per cent. are due to diseases of the respiratory organs, of which 12 per cent. being from tuberculosis and 9 per cent. from pneumonia; 12 per cent. are due to diseases of the digestive organs, 10 per cent. to diseases of the brain and nervous system, 7 per cent. to diphtheria and croup, 4 per cent. to heart disease, 3 per cent. each to typhoid and malarial fevers. Typhoid fever causes a greater proportion of deaths in small towns, villages, and rural districts than in large cities, and more in Northern than in Southern States. The last census year (1890), out of every 1000 deaths from known causes, typhoid fever produced 17 deaths in cities and 25.4 in rural districts, in those States where a complete registration was kept. Deaths from diphtheria were formerly about equally distributed, but recently it has increased in the cities, and in New England, in 1890, it caused more deaths relatively in cities than in the country.

The fourth annual report of the Texas Agricultural Bureau ¹¹⁰_{Dec., '92} gives the death-rate in Texas in 1887 as 13.15 per 1000; in some counties, however, the reports of deaths were not complete and in others they were altogether missing. Next to pneumonia the largest number of deaths was caused by typhoid fever.

The report of the Egyptian Sanitary Department ⁶_{Sept., '92} exhibits a lamentable mortality among children of tender age in that country. The returns refer only to thirty towns with a population of about 1,002,000, and for the last two weeks of the report the statistics of Alexandria were not included. Per thousand births occurring from June 1st to August 1st there were 798 deaths of children under 5 years, and in a total mortality of 11,017 the deaths under 5 years amounted to nearly 70 per cent. At Damietta, where the people drink cistern-water while the Nile is low, the birth-rate was largely in excess of the death-rate, the percentage

of infant mortality being only 47.2. Rosetta also was formerly considered a relatively healthy town, but of late years a canal has been dug, the water of which the poorer classes of the people are compelled to use, the public cisterns being no longer filled, and as a result 517 deaths out of 1000 occur among children under 5 years of age. The principal enemy to public health in Egypt is the Irrigation Department. Its agents erect locks and dams everywhere in order to retain a sufficiency of water for the field. The crops flourish, therefore, and the children die.

Colah¹⁰⁹²_{June} compares the three censuses made in the Bombay Presidency, the first in 1872, the second in 1881, and the last in 1891. The population in 1872 was found to be 16,308,343; in 1881, 16,489,274; and in 1891, 18,901,123. The reason for the non-increase of population in the nine years from 1872 to 1881 was the appearance of famine in several parts of the presidency in 1877 and 1878, during which years cholera and small-pox also prevailed throughout the country, causing a heavy mortality.

Pearse²⁶_{June 1} was superintendent surgeon on a coolie-emigrant ship on a voyage from Calcutta, on which the number of adults was 450, besides some children; but 5 deaths occurred during the voyage. He is of the opinion that this good result was due to the careful treatment of the coolies, especially guarding them against cold air and chills. The ventilation was regulated in such a way that draughts of air could be prevented, and the coolies were made to wear warm, woolen shirts, and were sustained by healthy and well-prepared food.

Regnault³¹_{June 28} gives a description of the English hospitals in India, and calls attention to the fact that, while the hospitals, with their large windows opening upon corridors, and their cool, spacious, well-ventilated rooms, are to be much praised, the Leper Asylum of Calcutta is a house with low, ill-smelling rooms, where about one hundred lepers are gathered together without nurses or attendants, awaiting death.

The census of Burmah¹⁰⁹²_{Aug.} states that its area is 171,430 square miles, with 8,098,041 inhabitants. In lower Burmah the population has increased, since 1881, 24.67 per cent. Marriage is very easily contracted and annulled, and consequently very few illegitimate births occur. The population of Cambodia consists, in the opinion of Manuel,⁹⁹⁶_{May 10} of a mongrel race of Aryan invaders, com-

ing from Hindostan, with a mixture of Malays, Tagals, Chinese, and other races.

PHYSIOLOGY AND PATHOLOGY OF THE INHABITANTS OF
TROPICAL REGIONS.

Lehmann⁴ states that in reality we know very little regarding the physiology of the natives of the tropical regions; Daubler has found the capacity of the lungs, in proportion to bodily size, to be somewhat greater in the Malayan race than in the European, the frequency of respiration in the Malayan being, on an average, 20.3 to 20.6 per minute, whilst that of the Dutchman and German averages 19 under the same conditions. Lehmann has confirmed the statement of Glogner that the natives of Java give out more heat through the skin than the Europeans, and that their bodily temperature is, on an average, half a degree lower. A permanent acclimation of Europeans in the tropics seems to be impossible, inasmuch as their unmixed progeny to the third or fourth generation have nowhere been observed. The following modifications are observed in Europeans living in tropical climates: Relaxation of the muscular system supervenes, respiration becomes more superficial, in most instances the bodily fat is reduced; the skin develops a tendency to free perspiration, and the secretion of urine is reduced; in almost every case a paler hue is imparted to the skin, although it has been found that the number of blood-corpuscles and of haemoglobin in the blood remains unaltered in subjects of normally good health who have passed many years in India, Tahiti, or similar places, and that the blood of the natives was identical with that of the Europeans; there is, consequently, no ground for explaining the pallid hue by a physiological tropical anaemia. While the secretion of nitrogen through the urine is diminished, the average discharge of chlorine is equal to that in Europe.

The hygienic conditions of the island of Cuba are not enviable. Trelles⁴⁵⁰ July describes the mortality and epidemiology of Matanzas in the following terms: "The population does not increase on account of the great mortality, especially among the negroes, among whom there are five deaths to one birth, and, as no negroes have immigrated since the liberation of the slaves, that part of the population is rapidly disappearing; the mixed races increase very

slowly, and only the whites (Spaniards) increase in number. The authorities of New Zealand ^{Oct. 15, '92}⁶ congratulate themselves on account of the ever-increasing sobriety of the natives, and the improvement of their general health. This good impression is, however, somewhat diminished when it is learned that the reason for the sobriety of the Maoris is their absolute poverty, as they are compelled to live on the pittance allowed by the government, and are forbidden to alienate the land or its products; in all other respects the hygienic conditions of their dwellings and their mode of life are as bad as before. The Hawaiians are disappearing rapidly, and it is the opinion of Alvarez ^{July}⁷⁷ that this is due to the prevalence of syphilis, the abuse of alcohol, and the great mortality among the newborn infants. The natives are generally treated by the Kahunas, or native sorcerers, who cure all diseases by incantation and awa, an intoxicating drink, and who occasionally give their enemies deadly poisons instead of remedies.

Nassau ^{July}⁶¹ treats of the food of the West African natives, which consists mostly of the tubers of cassava, or manihot, and the fruit of the plantain. He gives many details as to their cultivation and preparation for food. Michaut ^{Oct. 30, '92}⁶⁷ states that the climate of Japan seems to be very dangerous to Europeans, owing to the sudden changes of temperature and the extreme moistness of the air, especially in the central part of the country, extending from Nagasaki to Tokio. During the year 1890 it rained 181 days, and the sky was clear only 43 days. Diseases of the respiratory organs are very common, and pulmonary tuberculosis ordinarily takes a very rapid course in Japan.

Borden ^{July}⁹⁹ describes the fate of the Apache Indians, now numbering only about 400. They have for generations lived in Arizona, an elevated region in the southwestern part of the United States of America. On account of their hostility to and frequent rebellions against the government, they were captured in 1886 and sent to Florida, and after some time to Southern Alabama. In the past four years their health has been much impaired by this change of climate and their enforced idleness and quiet mode of living, and the mortality increased to 142 per 1000 in a year; but after they were removed to a healthier region in Southern Alabama, a new and more-comfortable village was constructed for them, and 46 men enlisted in the United States army; in 1892 the death-

rate was 109.75 per 1000, the deaths being principally from pulmonary tuberculosis and among infants.

Treon⁵⁹ _{Apr. 1} states that 19,793 Indian children were in 1892 attending American schools; and while it has been maintained that the confinement and restrained life in school affected the health of Indian children, Treon shows, by comparing the death-rate at the schools with that of the villages, that the children at the former have a better chance of living. It is also worthy of note that five years ago nearly one-half of the children enrolled were troubled with scrofulous sores, whereas now only a few are so afflicted,—a fact due, no doubt, to the improved diet and sanitary surroundings of the schools. Of course, the buildings should be carefully constructed, with bath-rooms, etc.; some of those now in use are said to be inferior, overcrowded, and not sufficiently ventilated. It is recommended not to press too much school-work on the children at once.

Zaborowski²⁰⁸ _{Dec. 24, '92} discusses the future of the different races of the earth, and shows that many races have perfectly adapted themselves to their conditions of life and have developed the special arts and acquirements necessary to them, while at the same time incapable of developing a higher standard of civilization. Many of the inferior tribes are unable to count beyond two or three, their language consists half of words and half of signs, the vocabularies of the languages of some tribes not containing more than about 300 words, which constantly vary in sense, while the vocabulary of the cultivated Englishman contains from 3000 to 4000 words. Goethe and Voltaire used about 20,000 words. This is supposed to explain the small results obtained by missionaries among the inferior races. The children of savages can, as a rule, acquire a great deal of knowledge, but upon arrival at the age of puberty they retrograde and revert to the life of the tribe. An instance is cited of a Brazilian Indian who had been educated and succeeded in obtaining the degree of M.D., but who, nevertheless, gave up all and returned to the woods. In the opinion of the author, Europeans will in the future supplant the native populations in many regions; but in others the climatic conditions are not propitious to Europeans, and other races will continue to increase. In the Southern States of the United States the negro population has of late years greatly increased; in 1870 their number was 4,886,000,

in 1890 it reached 7,470,000. The Chinese will maintain their position in many parts of the globe, where the climate will not allow Europeans to do hard work.

MORTALITY.

The Australian Mutual Provident Society ^{Apr. 8} has published a report of the mortality experiences of the society, from which it may be noted that, while in England the larger insurances give the best risk and the mortality is greater among the small insurances, the contrary is found to be the case in Australia and America. The table giving the influence of occupation shows that mariners, publicans, and medical men are the worst risks, while clergymen are the best. The proverbial vitality of annuitants is confirmed by the experiences of the Australian Society: As regard males, the actual deaths were but 85.6 per cent. of the expected number, and females only 67.9 per cent. of the expectation. From the tables of mortality, it appears that pulmonary tuberculosis is as fatal among the old as among the young. The percentage of deaths from tuberculosis during the year 1890, based on the actual male population of New South Wales in April, 1891, is about 0.2 per cent.; or, to be more exact, it varies from 0.18 per cent. in the group of ages from 25 to 30 to 0.21 per cent. in the group of ages from 60 to 65,—showing a gradual increase as age advances. (This has already been proved by Lehmann, in 1886, to be the case in Denmark, especially in the towns.)

In the last fifty years the average duration of life in France has increased from 32 to 38 years. Turquan ²⁰⁸ _{Dec. 24, 192} explains this by the fact that, while the vitality has increased, the ratio of births has diminished. As the newborn give a large contingency to the death-rate, its influence on the average duration of life is easily understood. The average duration of life in France was as follows:—

Date.	Age.
1806-10	31 years 6 months.
1821-25	31 " 5 "
1836-40	34 " 11 "
1856-60	36 " 5 "
1866-76	37 " 3 "
1877-86	40 " 2 "

In proportion to the births the number of deaths has also diminished, as the following table shows:—

From 1820 to 1830, of 100 births, 59.5 reached the age of 20 years.
" 1831 to 1840, " 100 " 61.7 " " " 20 "
" 1841 to 1850, " 100 " 60.7 " " " 20 "
" 1851 to 1860, " 100 " 61.5 " " " 20 "
" 1861 to 1870, " 100 " 62.6 " " " 20 "
" 1871 to 1880, " 100 " 62.1 " " " 20 "
" 1881 to 1890, " 100 " 63.0 " " " 20 "

In another paper, ²⁰⁸ _{Dec. 10, '92} Turquan discusses the survivors of those who took part in the wars of the first French Republic and the First Empire: 27 of these soldiers were living in 1892, the eldest of whom was born in 1786 and the youngest in 1800, their average age being 97 to 98 years. During the last few years their mortality has diminished in a remarkable manner, and these men from the beginning of the century seem to have possessed a greater vitality than the following generation; so much the more is it, therefore, to be deplored that the wars of the Empire deprived France of about a million vigorous men.

MARRIAGE AND CONSANGUINITY.

Regnault ²⁰⁸ _{Feb. 25} proves, by abundant citations, that consanguineous marriages are the more avoided as the individuals become the more advanced in development. In the lower forms of the vegetable kingdom auto-fecundation is impeded by many ingenious mechanisms, and in the more highly developed plants it seems to be essential that the parent plants grow in different places; fecundation by neighboring plants is prevented by various means, there being but few exceptions to this rule. In insect and vertebrate life nature avoids union between brothers and sisters and between inhabitants of the same place. This is explained either by the fact that one of the sexes develops more rapidly and is sooner capable of reproduction than the other, or by migration before copulation, both males and females in this manner congregating in places distant from their place of birth. As nature has taken so much trouble to prevent consanguinity, it is reasonable to believe that consanguineous unions must produce bad results; yet Darwin has found that in some instances varieties of plants formed by continued auto-fecundation surpass in height and breadth those raised by common cross-fecundation; and although stock-breeders, as a rule, do not favor consanguineous unions, good stocks of cattle, horses, etc., have sometimes thus been produced.

In the case of man, history and ethnography prove that by consanguineous union the race tends to degenerate, and that the best results follow when marriage takes place between persons born in different places. On this account the laws of many tribes prohibit intermarriage. Almost all religions prohibit consanguineous unions, and in many the marriage of persons who have been educated together in the same family is not allowed, although their parents may not be related.

BACTERIOLOGY.

BY HAROLD C. ERNST, A.M., M.D.,
BOSTON.

Actinomycosis.—A method for securing permanent preparations of the actinocladothrix in pus is as follows ²²⁰_{Oct. 21, '92}: The material, placed on a cover-glass, is freely washed with ether, and then allowed to soak for some time in a concentrated solution of potash, or caustic soda, *freshly prepared* (old solutions are apt to be loaded with fungi). The potash solution is replaced with a watery solution of eosin (5 in 100) for ten to fifteen minutes, then washed with concentrated solution of acetate of soda or potash, mounted in the same, and sealed with paraffin.

Bacillus Aërogenes Capsulatus.—Graham, Stewart, and Baldwin ²³³_{Aug.} report a case in which this organism was found. (See Welch and Nuttall, ⁷⁶⁴_{July, Aug., '92} and this department in last year's ANNUAL.)

Air.—Tassinari ⁹⁹⁶_{Apr. 10} shows that there are much fewer bacteria in the air of a cloth-factory where hand-labor is employed than in one where machinery is used, and this independently of systems of ventilation. In the latter case there were, in summer, 1597 bacteria per cubic metre, and 9678 in winter, whilst in the former there were 14,717 and 67,111, respectively.

Alexins.—Hankin, ²_{Jan. 28} in attempting to test his theory that the alexins, to the presence of which serum owes its bactericidal property, are normally contained in cells (leucocytes), and only pass out into the fluid around the cells after death, or under suitable stimulation, has made a long series of experiments. As a result, he believes that the eosinophilic cells are the source of the bactericidal property of the blood-serum.

Algæ.—Beyerinck ⁵⁰_{Mar. 23} calls attention to his success in the culture of some of the algæ upon nutrient gelatin.

Amœbæ.—The discovery of these organisms in an abscess of the jaw, by Flexner, ⁷⁶⁴_{Sept., '92} is interesting, and, in connection with other similar work, is used to support the position already held by most

experimenters—that other micro-organisms than bacteria may be associated with disease processes. The same organisms are spoken of by Posner ² _{July 29} as occurring in the urine of a case under his care, and he quotes three other recorded cases of the same character.

Anaërobic Bacilli.—Grimbert ³²⁷ _{June 15} gives a long account of anaërobic fermentations produced by the “bacillus orthobutylicus” and their variations under certain changed biological conditions.

San Felice ⁵⁸ _{July 7}, gives a very fine summary of studies upon anaërobic organisms. He employs two methods,—one, to pour the culture, in agar or gelatin, upon a sterilized plate, and to cover it as soon as hardened with a second plate placed immediately upon the nutrient medium; the second method is that of Liborius with a slight modification. After the culture has been made in fluid agar, the tube is carried, as quickly as possible, into a vessel containing cold water, so that hardening may occur rapidly, and by so much prevent the entrance and solution of oxygen from the air. One must not neglect to pour several times from one agar tube to another, so that the colonies may be well separated from each other. The tubes, as soon as the agar is hardened, are placed in the incubator, and when the colonies have sufficiently developed they can be isolated as follows: The tube is warmed in the flame so that the tube of agar may be removed, and this is then cut into thin slices, on a sterilized plate, with a sterilized knife. The slices can be studied under the microscope, and the colonies may be used for culture. The author succeeded in obtaining cultures of many anaërobic bacteria after this method, some new, but especially those of tetanus, malignant oedema, and anthrax.

Anthrax.—Carr ⁷⁵⁷ _{May} studied the action of anthrax bacilli in milk and found that they flourished well in fresh non-acid milk in twenty-four hours, that they preserved their virulence in it, and that the loss of vitality and virulence seemed to depend upon the increasing acidity of the medium. Maurel ⁹⁹⁶ _{June 25} found, by his experiments, that there was a distinct attenuating action of the blood-serum of human beings, both upon the virulence and reproductive power of the anthrax bacilli, and concludes that this may have a part to play in the cure of malignant pustules, and especially in the cases of spontaneous cure that occasionally occur.

Hankin and Westbrook, ²⁶² _{p. 633, '92} working upon the albumoses and

toxalbumins of the bacillus of anthrax, found that : 1. This bacillus produces a proteolytic diastase which acts upon poietic matters, decomposing them with the formation of albumoses. The albumoses thus obtained have no immunizing power. 2. The bacillus of anthrax can produce another albumose, directly without the intervention of a diastase. 3. They could obtain this albumose in a relatively pure form—that is, without being mixed with the albumoses of digestion—by cultivating it in a solution of pure peptone. 4. This albumose, in very small doses, confers a power of resistance to anthrax upon mice, a power sometimes extending to complete immunity, but most often manifested by a considerable resistance only. 5. In ordinary doses this albumose produces no symptom of poisoning in animals susceptible to anthrax. 6. In animals possessed of a relative immunity to anthrax like the rat, the frog, and the crayfish, this albumose acts as an energetic poison. 7. Young rats, on the other hand, which are susceptible to anthrax, are not poisoned by this substance.

Phisalix⁴¹⁰ shows the influence of various temperatures upon the spore-producing power of the bacillus of anthrax, and demonstrates the persistent absence of this power by means of the heredity of the acquired property. He studied the variability of the spore-producing function of this bacillus, and believes that its occurrence is of the greatest importance in specific determinations; that one cannot be too careful in the selection of distinguishing marks of various bacteria; and that the natural history of the bacteria is, from this point of view, at a similar stage to that in which the tænia, and the cysticerci from which they come, were classed in two separate groups. When all the phases of the evolution of a bacterium and its modifications under the influence of various media are better known, it is probable (?) that many of the present divisions will disappear.

Maximowitsch and Grigoriew⁴¹¹ report two cases of anthrax infection in men, of special interest as cases of what may be called double infection, as well as apparently showing changes in the virulence of the bacilli.

Antiseptics.—Trambusti³⁷⁶ ¹⁵⁷ found it practicable to produce a tolerance of corrosive sublimate in certain bacteria. By making cultures in bouillon with increasing quantities of sublimate Friedländer's pneumobacillus, for example, would grow in a solution

of 1 to 2000, whilst ordinary cultures were inhibited by 1 to 15,000. Similar facts were demonstrated in cultures of the streptococcus pyogenes aureus, bacillus of swine-plague, anthrax, and chicken-cholera.

Attenuation.—Charrin and Courmont,¹⁴ Mar. 15 in summing up the principles of the attenuation of virulence of bacteria, and using the work done upon the bacillus pyocyaneus as a basis, consider that this action is due—if not entirely, certainly in part—to the action of the bacteria themselves, but that other factors must also be taken into consideration, such as the vital force of the subject, the disappearance of nutritive elements, etc.

Beriberi.—This has been studied anew by Musso and Morelli,⁵⁵ Jan. 21 who report having succeeded in isolating, by culture from the blood, the effusion into serous cavities and subcutaneous tissues, the peripheral nerves, and the medulla, micrococci that they believe to be identical with those already described by Lacerda, Ogata, and Eykmann.

Blood-parasites are studied by Starcovici,⁵⁰ July 1 in observations upon those seen by Babes in the latter's haemoglobinuria of cattle, Texas fever, and sheep disease. They occur in the red blood-corpuscles, and an interesting table, showing the comparison between them, is given in the article.

Blood-serum.—Jamma⁴¹ Apr. 20 has made some important studies upon the antibactericidal power of human blood-serum. Emmerich and Tsuboi⁵⁰ May 4 give certain experiments upon the increase and regeneration of the bactericidal action of blood-serum in health; Gatti,⁵⁸⁹ Aug. 14 some very good work on a similar subject during infection; and Buchner³²⁴ B.17, p. 112; Sept. 11 ⁴¹ summarizes conclusions—too long to more than speak of here—upon the bacteria and globucidal properties of blood-serum.

Cancer.—The past year has been no exception to those immediately preceding, and the controversy upon the parasitic or non-parasitic nature of cancer has been carried on as actively as ever. Naturally, much attention will be paid to any work of Metschnikoff,⁸⁶⁰ Sept. 30, '92 who gives a very elaborate summary of his views upon carcinoma and coccidia, and who affirms that it is not possible to deny that the round bodies so often found in carcinomata present, according to our present knowledge, the greatest analogy to coccidia, and that in order to arrive at a definite con-

clusion it would be desirable for pathologists to unite with zoölogists who are familiar with the sporozoa.

Ruffer ²⁴⁷ _{Oct. '92} notes further observations and methods of staining the parasitic protozoa in cancerous tumors. An admirable review ⁹ _{Jan. 7} ends with a caution against laying too much stress upon parasitic organisms, granted that they occur, of which so little is known, as is the case with the protozoa. Ohlmacher ⁶¹ _{Feb. 4} calls attention to an exceedingly important "peculiar nuclear safranin reaction, and its relation to the carcinoma-coccidia question," which may be summarized as follows: 1. A precipitation of deep-red material may be produced when the solutions of safranin and iodine or safranin and picric acid are mixed directly. 2. A precipitation of similar deep-red material is produced in *tissue* when safranin and iodine or safranin and picric acid are employed in the staining process. 3. The precipitate occurs in any of the elements, either of normal or of pathological tissue, and may occur either in the nucleus or in the cytoplasm. 4. This artificial product occurs in the cells of sections of carcinomatous tissue prepared as directed by Podwyssozki and Sawtschenko. ⁵⁰ _{v. 11, '92} 5. Therefore, the multiform red particles occurring in the cells of carcinomatous tissue prepared by the safranin-picric acid method are artificial products; and since Podwyssozki and Sawtschenko base their arguments on the presence of these red formations in their so-called "coccidia," their conclusions must be valueless. At the same time, the author disclaims any intention of entering upon the question of the existence or non-existence of sporozoa; but the fact that the method of staining employed by the authors quoted, and widely used elsewhere, may produce such results, is an extremely important one for investigators to realize.

Korotneff ⁵⁰ _{Mar. 23} gives a long account and numerous cuts of a parasite—*rhopalocephalus carcinomatosus*—which he observed in sections from a carcinoma of the lip.

Browiez (report of Corr. Editor Drzewiecki, Warsaw ⁶⁷³ _{Mar.}) takes very strong ground against the parasitic origin of cancer, and attaches no importance to the many observations said to have been made of the protozoa in these tumors, laying especial stress upon the non-inoculability of cancer. As an interesting corollary to this Courtin ¹⁴ _{Apr. 19} cites a case of auto-inoculation of cancer, following the line of puncture with a trocar. Soudakewitsch ⁵⁰ _{Apr. 10} asserts that in

only six out of one hundred and fifty cases of cancer-tissue did he fail to find protozoa, and all of these six were "cancroide." He gives a plate showing the different behavior to osmic acid, safranin, and methylene blue.

Galloway⁴⁹⁹ discusses the parasitic nature of the protozoa in cancer, and, whilst declining to consider as settled their influence upon the production of cancer, speaks of their occurrence as undoubted. "No precaution should be omitted in the fixing and hardening of the preparations; if this be well done, the observer need not seek far for stains if he wishes simply to see the parasite." Borel, in a monograph, gives a very good summary of the work done and of the technique. He is not satisfied with the results thus far obtained.

L. Pfeiffer⁵⁰ publishes a very remarkable article upon the parasitic nature of epithelial cancer, as well as upon the occurrence of sarco-, micro- and myxo- sporidia in muscular tissue; a very fine plate accompanies the article, which will well repay study.

Mayet²¹¹ brings up an argument in favor of the infectious nature of cancer, by an apparently successful inoculation of a rat with material from human beings. The method employed was not to inoculate a portion of the tumor, but to saturate the animal with cancer-juice, diluted with glycerin, filtered through paper, and injected three times, the results appearing in the kidneys three months afterward; he took pains to employ non-ulcerated tumors. A very valuable discussion of the whole subject of the protozoa considered in relation to disease is that by Clark.²² Burchardt⁵⁰ describes a form of coccidium occurring in a gland infected from a gelatinous cancer of the uterus, and its encysted spore-formation.

Perhaps the most valuable American contribution to the general subject is that of Gibbes,⁵ in which he gives the following method for differentiating the protozoa: (1) sections hardened in alcohol are left eighteen minutes in a 2-per-cent. solution of rosanilin sulphate in aniline-water, washed in water, and left a few seconds in alcohol; (2) placed in a 1-per-cent. solution of iodine-green in aniline-water, until, on examining in distilled water, the sections are of a dull-purple tint,—water, alcohol, oil of cloves (?), xylol.

Cells.—Charrin⁸⁶⁰,⁴¹⁰ gives a very interesting statement of

the comparison to be drawn between the cells of the tissues and the cells of bacteria.

Cellulitis.—E. Fraenkel ⁵⁰ _{Jan. 1; Mar. 25} studied four cases of emphysematous cellulitis, finding a special gas-producing bacillus resembling morphologically and to a slight degree the anthrax bacillus.

Centrifugal Machine.—Lezé ¹⁴ _{Jan. 4} suggests that micro-organisms are more easily separated the larger they are,—molds, for example, more easily than bacteria. In order to make the latter separate more perfectly, the density of the fluid containing them may be diminished, and this may be accomplished by warming the fluid, or by the addition of other and lighter fluids than water,—ammonia, alcohol, etc.

Chancroid.—Rivière ⁷¹ _{Apr. 30} found in many soft chancres the bacteria described by Ducrey, and called a streptobacillus by Unna. The ordinary methods of staining did not satisfy him, and he obtained the best results by using Kühne's stain for the bacillus coli. His method is as follows: Fix by acetic acid, mount in paraffin, cut very thin sections ($\frac{1}{200}$ millimetre), and fix on slide with gum. Stain with alcoholic solution methylene blue, 10 drops, and carbonate ammonia ($\frac{1}{200}$), 4 cubic centimetres (1 fluidrachm). Wash in water. Decolorize with fluorescine in absolute alcohol for two seconds, wash in water, clear in bergamot (Canada). The bacilli are found at the base of the ulcer, occurring in masses of five or six parallel chains, sometimes colonies 120μ long. They are $\frac{1}{2}$ to $2\frac{1}{2}\mu$ long, $\frac{1}{2}\mu$ broad. They do not occur in syphilitic chancres, and may be considered as diagnostic.

Peterson ⁵⁰ _{June 8} has worked out the same subject with constant results, as above described. This method of staining is also a modification of Unna's: alkaline methylene blue, twenty-four minutes. Decolorize with aniline-oil and xylol, equal parts, for one-half to three minutes; three to ten minutes, with pure aniline-oil,—xylol—Canada. A second method is Löffler's: methylene blue, one to three minutes. Water-tannin solution (1 to 10), a few seconds. Water, etc. Whichever is selected, two points are to be looked after: The dehydration with alcohol must be very carefully done (better to soak up the water with filter-paper); and the section be dried before decolorizing. The best results are reached if the section be fixed on the slide first, with cedar-oil collodion. He thinks he succeeded in obtaining cultures on a nutrient medium

made up of two parts of agar with one part of human blood-serum.

Cholera.—The epidemic of cholera in Europe during 1892 brought out, as might be expected, innumerable papers upon all aspects of the subject, clinical as well as bacteriological. C. Fraenkel ⁶⁹ Oct. 13, '92 gives a study of methods and results of observations of the cholera spirillum in flowing water. Beck and Cossel ⁶⁹ Oct. 13, '92 lay stress upon the methods to be employed in diagnosis, and Simmonds ⁶⁹ Oct. 13, '92 shows the possibility of the transportation of the infectious element by means of flies. Ferrani ⁴⁵⁶ Sept., '92 calls attention to the inhibiting action of lactic acid upon the cultures of the spirillum, and suggests that its employment may be of value from a therapeutic point of view. Beck ⁶⁹ Oct. 6, '92 records a case presenting the clinical symptoms of cholera, in which culture demonstrated only a streptococcus. Dunham ⁵⁹ Oct. 8, '92 gives interesting results of experiments to show the length of time the spirillum will live on various substances, as in agar culture, in faecal matter, river-water, on textile fabrics, fruits, and vegetables, showing that in most cases the most active destructive agency is the growth of other bacteria. The Berlin Health Board (Report No. 42, 1892), and Lavrinowitch ⁵⁸⁶ No. 46, '92 made a series of elaborate investigations upon the same subject. Gabritschewsky and Maljutin, ⁵⁰ June 15 on the other hand, find that the cholera spirillum secretes a substance which is inhibitory to the growth of the bacillus coli, bacillus typhosus, bacillus anthracis, and bacillus pyocyaneus. Biernacki ⁶⁹ Oct. 20, '92 demonstrated the spirilla in the spring-water of a house in which thirteen cases of cholera occurred. Ketscher demonstrates the protective power of the milk of inoculated goats, when the milk was used in guinea-pigs, and by any method of inoculation. Uffelmann ⁴ Nov. 28 lays stress upon the necessity for making the diagnosis of the cholera spirillum in a well-equipped laboratory; under such conditions, it is comparatively easy,—otherwise not.

Bujwid ⁹ Dec. 5, '92; v. 12, No. 17 suggests the action of iodoform on cholera cultures (it delays liquefaction very markedly,—ten to fifteen days) as one aid to diagnosis. Gunther ⁶⁹ Dec. 8, '92 describes a new spirillum found in water, which closely resembles that of cholera, and Bleisch ⁵⁸ Dec. 28, '92 summarizes the methods to be used in the differential diagnosis of the cholera spirillum. Lazarus ¹⁵⁷ Jan. gives very interesting results as to the antitoxic action of the blood-serum of persons

recovered from cholera. The behavior of cholera (as well as of typhoid) upon potato has been a confusing element in the study of the organism, and Krannhols⁵⁰ Jan. 28 and Voges⁵⁰ Apr. 24 have made an especial study of the subject, including the differences between various kinds of potatoes, which have a certain uniformity in their nature.

Lesage and Macaigne²⁶² Jan. make the interesting observation, as the result of the study of two hundred and fifty-one cases of cholera, that in no one of them did they find the spirillum alone, but always mixed with one or more bacteria of other kinds (the bacillus coli most commonly). Finkelnburg⁵⁰ Feb. 8 and Trenkmann⁵⁰ Mar. 1 lay stress upon certain variations in the behavior of the cholera spirilla from different sources. Pettenkofer's and Emmerich's experiences⁸² Feb. 18 with swallowing cultures of the cholera spirilla certainly did not tend to destroy a belief in the specific nature of the bacterium, whilst those of Hasterlik⁵⁷ Mar. 5 seemed to furnish evidence of their negative power. Klein² Mar. 26; Mar. 28 concludes against Haffkine's anti-cholera inoculations, for, according to his experiments, we have no certainty that we are protected against the specific poison in the intestines, however carefully we may be protected against the effect of intra-cellular poison. Attention is called² Apr. 1 to Klemperer's method⁴ p. 1265, '92 of producing immunity by using the toxin, Haffkine's method being condemned as too cumbersome.

Borchoff⁵⁸⁶ No. 6 finds that corrosive sublimate has very little influence upon the dejecta, that milk of lime (20 to 100) generally kills them, but that a solution of sulphuric acid (1), carbolic acid (3), and water (100) will invariably destroy them. Alt⁶⁹ May found a toxalbumen, precipitable by alcohol, in the vomit of persons sick with cholera, which had an exceedingly toxic effect upon rats and guinea-pigs. The resistance to low temperatures has been studied and found to be marked by Uffelmann,⁶⁹ p. 158 by Montefusco,⁷⁵¹ May and by Renk.⁵⁴ p. 390 Freymuth and Lickfelt⁶⁹ May 11 give a method for completing the diagnosis of the cholera spirillum in six hours, which we should not favor. Schill, too,¹⁵⁰ June 8 gives rapid methods for diagnosis, and Stutzer and Burri⁵⁸ May 12 have renewed the study of the growth upon nutrient gelatin of various degrees of alkalinity. They consider that the "cholera-red" (indol) reaction can only be properly obtained in cultures that have been in the breeding-oven for at least six hours,—in this respect differing from Dunham, who thinks

four hours sufficient. Bleisch ⁵⁸ May 12 and Gorini ⁵⁰ June 15 devote much time to the consideration of the sources of error in obtaining this reaction and to means of avoiding them. Gorini ⁹⁹⁶ Sept. 10 says that, in order to be sure of securing the indol reaction, the peptone used must not contain carbohydrates (glucose, as is commonly the case), and must neither reduce nor decolorize Fehling's solution, but must give with it a persistent violet color, with ebullition. Naturally, much attention is attracted by R. Koch's statement ⁵⁸ May 26 of the present position of the bacteriological diagnosis of cholera, in which the whole subject is summed up in his usual exceedingly clear, terse style. An undescribed staining peculiarity of the cholera spirillum is given by Rohner, ⁵⁰ June 15 consisting in a deep stain after treatment with methylene blue.

Metschnikoff ²⁹² p. 403; ³²⁷ June 15 has an elaborate article upon the preventive properties of the blood of a person not affected with cholera, of that of those attacked by cholera, of that of those dead of cholera, and of that of those cured of cholera, which is of very great interest. Emmerich and Tsuboi, ³⁴ June 20 as well as Klemperer, ⁴ p. 74 write to prove that Asiatic cholera is a *nitrite* poisoning, the result of the growth of the specific bacterium. Uffelmann ⁴ June 20 shows that it is possible for the cholera spirillum to be taken up in the air in dust, and thus transported. William ⁵⁸ Aug. 26 carries out experiments with similar results. Bujwid and Orlowski ¹⁰⁹ July describe two "choleroid" spirilla which differ from the true mainly in not presenting the indol reaction. Lucatello ⁵⁷ Sept. 24 mentions another. Liebreich's article ¹¹ July 10 is characterized by Jaeger ⁶⁹ July 27 as follows: "This paper can be looked at in no other way than as a *provocation* to all the writings of Koch and his school for the last ten years upon the etiology of the infectious diseases." Uffelmann ²² Aug. 30 has shown the vitality of the spirilla on post-cards, which is spoken of as "the latest scare in microbes." Sobernheim ⁵⁸ B.I.4 gives the results, somewhat incomplete as yet, of work upon cholera poison and cholera protection. Kanthack and Westbrook ² Sept. 9 report on immunity against cholera,—an experimental inquiry of the bearing on immunity of "intra-cellular" and "metabolic" bacterial poisons, concluding that, as far as the cholera spirillum is concerned, (1) any one mode of immunization will protect an animal against an infection by any other form of inoculation used; (2) the serum of an animal immunized by any one method also protects guinea-

pigs against an infection by any other forms of inoculation ; (3) the distinction between an "intra-cellular" and a "metabolic" poison in their relation to artificial immunity must not be made too narrow. All this is in opposition to Klein's conclusions, before alluded to. Montefusco ⁹⁹⁶_{Sept. 10} continues the work showing that the spirilla resist considerably the action of low temperatures.

Cladothrix.—Acosta and Rossi ⁴⁵⁹_{No. 8} describe the "cladothrix invulnerabilis" which they found upon tubes of agar-agar as the result of an accidental contamination, and which is notable for its extreme resistance to destruction by quite high temperatures. Dammam ⁶_{Feb. 18} divides streptothrix A and C and cladothrix B, which he found,—A and B in Thames unfiltered water, and C in the saliva of a healthy individual. The distinction between streptothrix and cladothrix is summarized after Cohn, as follows : *Cladothrix*,—very fine leptothrix filaments, colorless, non-articulated, straight or slightly spiral, with true branching. The former presents a sheath, while the latter does not. It is the presence of a sheath in cladothrix that accounts for the false branching, for it holds together filaments which without it would fall asunder.

Clasmatocytes are, according to Ranzier, ³⁶⁰_{Apr.; Aug. 5} the fixed cells of the connective tissue and pus-globules. His researches show that they are formed by irritant action, and independent of bacteria in the lymphatic cells, where they multiply with great activity, and are a principal source of suppuration, which diapedesis alone could not easily explain.

Coccidium oviforme was studied carefully in an epizootic in rabbits by Felsenthal and Stamm, ²⁰_{B. 182, II, 1} who consider the coccidia merely as a mechanical irritant, without specific pathogenic properties of their own.

Coli Communis.—Abba ⁵⁸⁹_{Nov. 3} gives a very complete summary of the differences under culture of this bacillus and the bacillus pyogenes foetidus, which summary seems to be of much importance at the present time.

Achard and Renault ¹⁴_{Dec. 21, '92} emphasize previous work, showing that the bacilli most common in urinary infections belong to the group of the bacillus coli ; and that it is possible to distinguish in this group several distinct types, if one has recourse to more delicate tests than the comparison of cultures, pathogenic properties, or morphological appearances.

Macaigne ¹⁷_{Nov. 8, 10, '92} and Stone ⁶⁹_{June 29} furnish us with perhaps the most important study of the bacillus coli as yet published. The former points out the resemblance to the curved bacillus of Buchner, Brieger's faeces bacillus, and the bacillus pyogenes foetidus of Passet, with which he thinks it possibly may be identical. On the other hand, he differs from Achard, Renault, and Krogius in their effort to identify the bacillus pyogenes urinarius of Clado-Albarran with it, and points out the difference between the bacillus and others that closely resemble it,—the bacterium of dysentery of Chantemesse and Widal, the bacillus of endocarditis of Gilbert and Lion, the bacillus endocarditis griseus of Weichselbaum, and the bacillus enteritidis of Gärtner. But he devotes especial attention to the differential diagnosis between this and the bacillus of typhoid fever, while he sums up with the table of Glaudot, ⁴⁵⁴_{June, '92} as follows:—

BACILLUS TYPHOSUS.

- A. Very great motility and characteristic cilia,—long and numerous.
- B. Growth negative, or very feeble, in certain mineral media,—Nägeli's or Peterman's fluid.
- C. Absence of indol, or mere traces after eight days.
- D. Growth very slightly visible, without pigment, on certain colored opaque media,—artificial potato.
- E. Decomposition of media to which has been added glucose *without* gas-production.
- F. No coagulation of neutral or alkaline media even after a month.
- G. Attacks lactose and glycerin very feebly, without gas.

BACILLUS PSEUDOTYPHOSUS.

- A. No, or very slight, motility; no cilia, or less long and abundant, or different from those of the typhoid bacilli.
- B. Growth abundant.
- C. Appreciable quantity of indol (one exception in thirty-four varieties tried).
- D. Well-massed, distinct growth of clear or dirty-brown color.
- E. Decomposition with gas-production.
- F. Some coagulate milk solid, with gas; others precipitate casein slowly, without coagulation,
- G. Active fermentation of lactose, maltose, and glycerin.

Finally, according to Blachstein, ¹¹⁰¹_{'92} the typhoid bacillus produces in normal media a lactic acid rotating to the left, whilst the bacillus coli produces one rotating to the right. Semel ⁴⁵⁴_{Feb.} studies very completely the acids produced by the bacterium in various media, and Gilbert ¹⁴_{Mar. 1} and Roger ¹⁴_{May 10} give some account of the poisons produced by it. The part it plays in the affections of the anus and rectum is illustrated by Hartmann and Lüffring ⁷_{Mar. 10} by

culture in cases under their care, and a very good summary of our knowledge of the organism, up to date of publication, is given by Chéron.¹⁷

Fordyce²⁴⁵ quotes three cases of bacillus coli in the urine, and Hallé¹⁴ considers that the bacillus coli plays only a slight part in the ammoniacal fermentation of this fluid. Chambrelent and Sabrazés¹⁸⁸ made experiments which seemed to them to demonstrate the passage of the bacterium from the mother to the foetus in rabbits.

Sordoillet²¹² considers the extremely interesting point of the action of the bacillus coli in peritonitis without perforation, believing that it may have such an action. A certain amount of skepticism is permissible, as to whether the "perforation" was not so small in the experiments quoted as to escape detection.

Brix,¹⁴ studying the febrile action of the bacillus coli, states that cultures forty-eight hours old injected into the ear-vein of rabbits are the best for procuring the results. Roger⁴¹⁰ shows that the toxins elaborated by the bacillus coli produce in the frog a poisoning which has three distinct periods,—initial paralysis, hyperesthesia, terminal paralysis.

Ide⁵⁰ develops an hitherto poorly worked-up phase of the development of the bacillus coli,—its anaerobic properties as compared with certain other similar bacteria; and Abba⁷²⁷ recounts experiments showing its constant presence in cows' milk.

Cystitis.—Schnitzler⁵⁰ describes a gas-producing bacillus which he found in the urine of a patient with cystitis, and which he considers to be different from others found in the same or different situations.

Diastatic fermentation, as produced by bacteria, has been carefully studied by Cavazzani.⁵⁰

Diphtheria.—The absurdity of ill-directed experimentation is shown by Liebig,³¹ who reports having studied twenty-five cases of diphtheria, finding bacilli, cocci, mycelia, thallophytes, spores, and various other things; but, besides this, a curious sort of factor which he believes is composed of spirals, eggs, granules, and episperms. No description of their life-history is given.

Raposo⁵⁴⁹ has seen interesting indications of an antagonism between the bacilli of diphtheria and of tuberculosis; and Schreider,⁵⁸⁶ in investigating the reciprocal effects of the strepto-

coccus erysipelatis and the bacillus of diphtheria, showed that mixed cultures of the two were much more virulent than either alone. Ouchinsky²⁷³ _{May} agrees with Guinochet that the toxins of the diphtheria bacillus do not come from the decomposition of the nutrient media, but are elaborated by the bacilli themselves,—a process of synthesis; produced first in the bacteria, they pass thence into the nutrient media. This view is opposed to that of German observers.

Frosch⁵⁸ _{Dec. 28, '92}; ⁵⁰ _{Aug. 1} shows conclusively that the bacilli are present in the organs of persons attacked with diphtheria, as well as in the throat. Behring²⁰⁹⁰ gives an account of the experimental work done upon diphtheria, in which his own views are, of course, made most prominent. Tobiesen⁵⁰ _{No. 17} emphasizes the persistence of the diphtheria bacillus in the throats of convalescents, and the consequent danger therefrom. Out of forty-six cases discharged as cured twenty-four were found to have the bacillus still in the throat. Escherich⁴ _{No. 22} did not arrive at the same results as Hoffman³¹ _{June 21} in regard to the frequency of occurrence of the pseudodiphtheritic bacillus in the mouth and pharynx. Of three hundred and twenty cases examined, he found this bacillus only eleven times, and then almost always in connection with measles. He does not think it likely to obscure the diagnosis of diphtheria.

Rabot²¹¹ _{June 14} describes methods employed in Lyons for the detection of the bacillus of diphtheria, and shares Escherich's opinion as regards the pseudodiphtheritic bacillus. Johnston⁹ _{Dec. 10, '92} suggests the use of hard-boiled egg for culture from suspected throats. The end of the shell of the egg is clipped off, the exposed surface inoculated with material from a throat with a sterile wire, and the egg then inverted in an egg-cup. [In general, the use of egg-albumen does not furnish as satisfactory a result as growth upon blood-serum.—ED.] Parascandolo,⁵⁸⁹ _{May 2} however, considers it very valuable for general purposes, because of its ease of preparation and applicability.

Earth.—San Felice⁵⁸⁹ _{Nov. 3, '92} studied the toxicity of the anaërobic bacteria in earth, as compared with the tetanus bacillus, and Houston³⁶ _{June} the question of the number of bacteria in the soil at different depths. Instead of mixing the earth directly with the nutrient medium (Fraenkel), which obscures the results, he first dilutes it with a given quantity of water. His results show a

diminution in 1 gramme ($15\frac{1}{2}$ grains) of soil from 1,687,799 at the surface to 410 at a depth of six feet.

Electricity.—Krüger ¹¹⁴_{No. 22, p. 191} found that constant currents, even when non-polarizable electrodes were used, so that no chemical action could take place in the medium, prevented absolutely the development of bacteria without affecting their vitality. Vilato ⁴⁹⁴_{Mar. 31} ascertained the definite amount of current necessary for the destruction of several varieties of bacteria. D'Arsonval and Charrin ¹⁴_{July 5, 12} find that strong currents continued for a long time do destroy the vitality of bacteria.

Erysipelas.—Roger ⁹²_{Dec. 10, '92} made many experiments upon the streptococcus of erysipelas, with interesting results, among which were the following: Cultivated without access of air the streptococcus "secretes" toxic products, which are precipitated by alcohol and destroyed by heat; injection into the veins "of filtered cultivations" (*i.e.*, toxins), not heated, causes a long-persisting predisposition to infection. Similar solutions, after having been heated to 110° C. (230° F.) confer immunity. Roux ²¹¹_{Feb. 19} appeared to demonstrate the presence of the streptococcus of erysipelas in the air of a hospital by a special method of aspiration and culture medium. Know ⁴_{July 17} recounts a case that appears to give evidence of the identity between the streptococcus of erysipelas and the streptococcus pyogenes. After an injury to the foot an abscess developed upon the thigh, an erysipelatous blush also appearing about the edge of a small bed-sore that appeared later. In both the skin about the bed-sore and the abscess streptococci were found, indistinguishable from each other and from the streptococcus of erysipelas.

Faeces.—The "micrococcus tetragenus concentricus" is described by Schenck ²³³_{No. 8, 9, '92} as having been found by him in the stools of a case of chronic intestinal catarrh. Schmidt ⁸_{No. 45, '92} expresses the opinion that many of the bacteria found in children's faeces are but different forms of the bacillus coli, as he has apparently found an enormous amount of polymorphism in this bacterium under varying conditions of alkalinity and acidity of culture media.

Filters.—Arloing ⁵⁵_{Dec. 17, '92} calls attention to an exceedingly important fact, viz., that mineral filters (Chamberland) have a marked effect upon fluids passed through them, in that they

retain varying proportions of albuminoids, especially diastases, and other substances as well. Since these filters are used so much for the separation of bacteria from fluids now the subject of much attention, the modifying influence of the filter is of peculiar interest.

Gas-Production.—So much stress is now laid upon the various forms of gas-producing fermentations as means of differentiation between different forms of bacteria, that Hesse's study upon the subject⁵⁸ _{Aug. 29} is of especial interest.

Gelatin.—Heim⁵⁰ _{May 17} calls attention to spore-bearing bacilli occurring in gelatin used in preparing nutrient gelatin that required an exposure of *six hours* to free steam, or fifteen minutes to steam under pressure (one atmosphere) for the destruction of the spores.

Glanders.—Semmer⁹⁹⁶ _{June 25} has studied the diagnostic, prophylactic, and therapeutic uses of mallein. The results and best methods for employing this preparation are also discussed.⁴¹ _{June 5}

Glucose.—Paul⁵⁹⁵ _{Oct. '92} studied the varying amount of glucose found in bread according with the differing grades of fermentation of certain bacteria (yeast-fungi?).

Glycerin.—Sclavo⁹¹⁵ _{p. 663, '92} has shown that glycerin preserves the virulence of other bacteria than those of rabies and anthrax, notably Fraenkel's pneumobacillus (which it preserved for sixty-seven days) and chicken-cholera. Anthrax lost its virulence completely by the ninth day.

Gonorrhœa.—Hogge,²⁶⁶ _{Apr.} in an article upon "Gonococci and Pseudo-gonococci," lays down laws of diagnosis that seem to be unnecessarily severe in most cases. Touton⁴⁵ _{Jan.} studies the occurrence of the gonococci in the tissues of the glands of Bartholini, one of his conclusions being that the inflammation set up by them has a tendency to modify the cylindrical epithelium, and turn it into pavement cells. Hugonnenq and Eyraud³⁶⁰ _{Apr.} have separated an organism occurring in gonorrhœal orchitis that resembles, but is larger and distinct from the gonococcus of Neisser. Ghon and Schlagenhauf⁸ _{No. 34} suggest two modifications of the serum-agar method of cultivating the gonococcus. The first is that of smearing a disc of men's blood-serum on the surface of ordinary agar, the gonococci growing well; second, the addition of acid human urine to nutrient agar, the growth being especially favorable upon this medium.

Immunity.—This exceedingly important subject has been

studied from very numerous points of view during the past year. Brunton and Bokenham ^{Jan. 7} found that saturation (?) of guinea-pigs with chloride of potash did not in any way diminish their susceptibility to anthrax. Mlle. Everard, Demoer, and Mussart ^{Feb. 262} studied the modifications of the leucocytes in infection and immunity, with the following results: If a living or a dead culture be injected, an "hypoleucocytosis" is produced. If infection do not occur, the "hypoleucocytosis" gives place to an "hyperleucocytosis," the "leucocyte-pus" becoming especially numerous. If the animal succumb to the infection, there is no "hyperleucocytosis," and if the disease is slow in progress, a series of oscillations in the number of the white globules is apparent. Roosevelt ^{Mar. 15} and Hervieux ^{Mar. 28} give summaries of the various theories in regard to acquired immunity from infectious diseases. The former emphasizes the possibility of the transmission of acquired as well as hereditary traits through generations of tissue-cells. The latter considers natural and acquired immunity as attributable to "phagocytism," and as a condition directly the opposite of "receptivity." His discussion is based upon studies of the action of vaccine-virus and variola. Charrin and Gley, ^{Jan. 410} after certain experiments upon the hereditary transmission of immunity, make the statement that "heredity is a property of the cells," and then enter into general speculations as to how this property acts in producing immunity. Klemperer ^{50 Apr. 24; July 57 80} gives some of his results in producing immunity to infectious diseases. He followed three methods,—subcutaneous injection of virulent cultures, injection of warm cultures into the stomach, and injection of the milk of immunized goats. This author's experiments are conducted with such especial accuracy that they are deserving of particular attention. Herrock ^{Aug. 15} is the author of a very complete review of the work done upon immunity in 1890–1892. Charrin ^{Dec. 10, 1902} publishes a remarkable paper upon the natural defenses of the organism against infection, concluding as follows: "It is rare that a parasite is subjected to but one influence. The secretions do not allow it to overcome all the forces it finds opposed to it, either that it may break up the epithelium or struggle against the phagocytes. Without recapitulating the other processes that may be directed against it, let us repeat that it is the phagocytes that habitually attack it, at a moment when it is not in its full vigor."

Sanarelli²⁶²_{v.7, No.3} considers the especial means of defense of the organism against bacteria, after vaccination and in cure, to consist of leucocytic action especially. Righi⁵⁸⁹_{July 26} has summed up the very interesting subject of the part played by the spleen in the production of immunity. Ely,⁵_{Aug.} Canfield,⁵_{Sept.} and Vaughn⁷¹_{Sept.} all write interesting papers upon immunity. The former is a general review, the next a consideration of the subject from a clinical stand-paint, and the latter an important contribution in which especial stress is laid upon the statement that "the antidotal substance is a nuclein." I use the word "nuclein" in a broad sense, including the true nucleins, nucleinic acid, and nucleo-albumens. By the term "nuclein" I mean that part of the cell which, under normal conditions, is endowed with the capability of growth and reproduction, which assimilates other proteids and endows these assimilated substances with its own properties." See also Vaughn, Novy, and McClintock⁹_{May 20} on the germicidal properties of nucleins. Metschnikoff³_{Nov. 26, '92} makes an important summary of the recent views in regard to immunity up to the time of the publication of his article.

Inflammation.—Matos²⁰⁹¹_{No. 23} takes up the various theories of inflammation in order,—(1) the cellular, (2) the vascular, (3) the nervous, (4) the neuro-paralytic, (5) the trophic, (6) the neuro-vascular-cellular,—showing the weaknesses and omissions of each. Cattell¹⁹_{Jan. 14} also shows the unsatisfactory condition of our knowledge of the subject, and Unna⁹_{Jul.} lays much stress upon the influence of chemotaxis in producing the process.

Influenza.—The resistance of the bacillus of this disease to various physical and chemical agents was carefully studied by Tizzoni.⁷⁵⁷_{No. 12, '92} Bruschettini⁵⁸⁹_{Apr. 8, 10, 11, Aug. 12} gives the results of very elaborate studies of the bacillus, especially of its pathogenic action upon rabbits. The occurrence of the bacilli of this disease in the blood of persons attacked by it has been studied by Canon,²⁰_{B. 131, H. 3} who made use of the following method of staining: Cover-glasses, dried in the air, are placed for ten minutes in absolute alcohol, and then in a stain of concentrated watery methylene blue, 40; $\frac{1}{2}$ -per-cent. alcoholic eosine, 20; distilled water, 40; for twenty-four hours at 37° C. (98.6° F.); washed in water, dried, and mounted in Canada. He says that sometimes at least three-quarters of an hour must be spent in searching each cover-glass.

Intestines.—Gilbert and Lion¹⁴ have studied the bacteria in the intestines, and conclude that there is present in them more than one variety of the bacillus coli communis. Rappin¹²⁷ writes a very elaborate article upon the same subject. Vallet's article⁶ will also be of interest in the discussion of the bacilli of the intestines, as expressing his view of the identity of the bacillus coli communis, and the bacillus of typhoid fever.

Iodoform.—The efficacy of iodoform against the staphylococci—a matter well established by clinical experience—is explained by Maurel¹⁴ as due to a double action, an increase in the energy of the leucocytes and a diminution in the virulence of the staphylococci.

Kidneys.—Cavazzani⁸⁵⁴ attempted to determine whether or not bacteria could pass through the normal renal epithelium, and thus be excreted by the kidneys, finding that this was not possible.

Leprosy.—Successful cultures of the bacillus of this disease are reported by Ducrey,⁵⁰⁷ in grape-sugar agar and in bouillon *in vacuo*. Walters⁵⁰ reviews all the work done upon the subject since the beginning of the application of bacteriological methods, and Campana⁵⁸⁹ gives the technique of preparing various culture media that have been suggested.

Light.—Buchner,⁵⁰ after studying the effect of light upon bacteria suspended in water, found that sunlight and even diffuse daylight had a powerful disinfecting effect upon certain pathogenic and fermentative organisms, and concludes that light is to be looked upon as the most powerful agent in the purification of rivers and lakes containing bacteria that are hurtful to man, such as the bacillus of typhoid and the spirillum of cholera.

Liver.—Barbacci³⁷⁶ investigated two cases of suppuration of the biliary duct, and studied the literature of the subject, finding that such suppuration may be caused by a number of varieties of bacteria.

Malaria.—Coronado⁴⁵⁹ claims to have obtained cultures of Laveran's plasmodium of malaria. Helier²³⁹ gives a detailed account of the methods of examination of the blood for the parasite; he states that his attention was attracted to it in the blood of certain sepoys before he had heard of Laveran's work, and enumerates the various forms met with; he agrees with Marchiafava and Bignani,⁶⁹ that the organism is the same, but passes

through different stages in the red blood-corpuscle. Mannaberg's special monograph²⁰⁹³ upon the malaria parasite should be in the hands of every one studying the disease. Brunton^{6 Aug. 12} gives an account of an organism closely resembling the plasmodium maliæ, which he found in the urine of a patient suffering from malignant disease of the bladder. Sforza^{531 Feb.} suggests Canon's method for the bacillus of influenza (see "Influenza") for staining the plasmodium maliæ.

Methods of Culture.—Beneke^{50 Aug. 7} advises that, in inoculating a gelatin-tube, the puncture be made quite at the side instead of through the centre, the advantage to be gained being the facility with which various details can be made out. This is a good suggestion as an additional form of culture, but it should not supplant the usual method. Recognizing the uncertainty of the cotton stopper for the exclusion of bacteria from pure cultures, A. Koch^{50 Mar. 1} has studied various methods of culture with the exclusion and free entrance of air.

Pascarole^{589 p. 101} discusses the advantages of egg-albumen as a culture medium for various bacteria, notably anthrax, cholera, typhoid, streptococcus pyogenes aureus, streptococcus pyogenes, chicken-cholera, tetragenus, deneke, and finkler. Sclavo^{757 Feb.} suggests a rapid method of staining cilia, which he claims is of especial value in all varieties of bacteria. Cover-glasses are prepared in the usual way (the material being diluted with a drop of distilled water, so that the layer may be as thin as possible) and are then stained as follows: One minute in a solution of 1 gramm (15½ grains) of tannic acid in 100 cubic centimetres (3½ fluidounces) of alcohol (50 per cent.); wash in distilled water; one minute in acid tungstic phosphate (phospho-wolframic acid), 5 per cent.; wash carefully in distilled water, then place for three to five minutes in saturated fuchsin crystals in aniline-water (warm); wash carefully in water, dry (with filter-paper if desired); mount in xylol-balsam. To remove the last trace of fat from cover-glasses, Zeltnow^{50 July 18} uses an iron plate, eight by ten centimetres, upon which the covers, previously cleaned in alcohol and ether, are placed, and the plate heated with a Bunsen flame. Covers are never broken in this way, and the result is perfect. The employment of copper is not permissible because of the formation of cupric oxide upon heating. Holten^{50 June 8} and Drosbach^{50 No. 14} both

describe ingenious methods for securing pure plate-cultures in fluid nutrient media. Müller ⁵⁰ May 4 describes an improvement upon Kitasato's holder for the inoculation of rats and mice. A new method for staining spores is described by Fiocca. ⁵⁰ July 1 The materials necessary are a 10-per-cent. solution of ammonia, an alcoholic solution of an aniline dye (gentian-violet, fuchsin, methylene blue, or safranin), a decolorizing solution of sulphuric or nitric acid (20 per cent.), and a watery solution of a contrast stain. To 20 cubic centimetres (5 fluidrachms) of the ammonia solution 10 to 20 drops of the dye are added, the mixture warmed to steaming, and the cover-glasses allowed to remain in it for from three to five (or for highly-resisting ones ten to fifteen) minutes; decolorized rapidly in the acid, washed in water, and a double stain made. Hein ⁵⁰ June 22 has used and improved upon the sputum disinfecter of Kirchner. ⁵⁰ B.9,p.5,791 Sputum of various kinds has been tested by Schmidt ³¹⁹ July 29 as regards its usefulness for the growth of the pneumococcus, the capsule being present on this medium. Bayet ⁸⁶⁸ Sept. 16 gives the methods and results of extemporaneous examination of the discharges during surgical operations. The spirochæta Obermeieri is stained by Bajenoff ⁶⁷³ Apr. as follows: The cover-glasses, very carefully prepared, are placed in a watch-glass containing 30 cubic centimetres (1 fluidounce) of water, to which has been added one drop of saturated solution of magdala dahlia in absolute alcohol. If this be warmed, the staining is complete in five minutes, but better results are obtained by leaving in the cold for two to three hours, then washing carefully, drying, and mounting.

Microsporon Furfur.—This parasite of tinea versicolor is described by Kotzlar ⁶⁷³ Feb. as follows: It is composed of mycelium and spores, the cultures of which do not liquefy gelatin; the mycelium forms a membrane on the surface of the gelatin, but never scattered or blackish points; old cultures of the fungus form a brownish membrane, which is composed only of spores; the mycelium is seen in the form of narrow, colorless threads, frequently crossed, but these threads never join or ramify; they vary from one-fourth to one millimetre in breadth; the capsule of the threads is homogeneous and very thin; the spores are round or oval, arranged in rows or chains, and vary in diameter from three-quarters to one millimetre; the spores show a strong tendency to growth; inoculations in rabbits give positive results.

Milk.—Roget¹⁴ notes the same curious fact in connection with the bacillus septicus putridus as he had before observed in the case of the bacillus of anthrax, viz., that it coagulates or does not coagulate milk, according as the culture is closely confined in a tube or freely aerated in a large flask.

Motility.—Roth⁶⁹ notes the interesting fact that motile bacteria develop a strong tendency to "swim against the stream" when placed in flowing currents.

Mucus.—Wurtz and Lermoyez,¹⁴ in a series of experiments, demonstrate the bactericidal properties of the mucus, especially of the nose. Anthrax spores were completely destroyed by it after three hours at 38° C. (100.4° F.). The authors consider the observation of great practical importance.

Mumps.—Laveran³ found, in a large proportion (seventeen out of twenty-eight) of cases of mumps examined, a special diplococcus, which he regards as a causal factor in the disease.

New Bacillus.—A "bacillus of mouse-plague" is described by Laser,⁵⁰ its appearance under cultivation, its pathogenic properties, and the result of feeding experiments with it, being given in detail.

Oedematous phlegmon is ascribed to new bacilli by E. Fraenkel⁵⁰ and by Harris.²⁴⁷

Parrots.—Nocard³¹ was led to investigate a series of deaths in a cargo of parrots, and found a special bacterium pathogenic for parrots, pigeons, chickens, guinea-pigs, rabbits, and mice, with all the symptoms of an haemorrhagic septicæmia.

Peritonitis.—Flexner⁴⁶⁴ describes a case of this disease produced by the proteus vulgaris.

Phagocytosis.—The theory of phagocytosis is discussed by Marot,¹⁴ and the results of experiments are given by Kanthack.² Faber³⁷³ concludes, after a study of the behavior of giant-cells, that, while ordinary phagocytes are sufficiently strong to fight small and not especially dangerous enemies, the more-resistant and more-dangerous intruders, as the bacilli of tuberculosis, are met by the giant-cells. On the other hand, Hemmeter⁹ endeavors "to bring out facts showing that Metschnikoff's theory of phagocytosis is insufficient to explain immunity."

Photobacterium sarcophilum is the name given by Dubois¹⁴ to a phosphorescent bacterium found upon meat.

Pneumonia.—Issaeff²⁶² has studied immunity acquired against the pneumococcus, with results exceedingly interesting and quite encouraging for the future. Pansini⁵⁸⁹ Jan. 13, 14, 16 describes several cases of acute primary nephritis apparently produced by the diplococcus of Fraenkel. Alfieri⁵⁸⁹ Feb. 3 found, in a case of fetid broncho-pneumonia, the staphylococcus pyogenes citreus, and a bacillus that he identified with the bacillus putridus splendens found by Bernadi in two cases of fetid broncho-pneumonia.

Pressure upon bacteria, as investigated by d'Arsonval and Charrin,⁷ was shown to have very marked results, fifty atmospheres killing the bacillus pyocyaneus within twenty-four hours.

Protozoa.—Galloway² Dec. 31, '92 discusses what is at present known in regard to the influence of the protozoa in certain diseased conditions, as does Clark. Aug. 16, Sept. 20 Kartulis⁵⁸ Dec. 28, '92 furnishes, perhaps, the best paper of the year upon certain pathogenic protozoa in men,—including gregarinæ of the liver and abdominal muscles, and amœbæ in bone-necrosis (osteomyelitis) of the lower jaw.

Bacillus pseudo-iris is described by G. Roux²¹¹ July 23 as found by him in the filter-basins of Lyons.

Ptomaines.—Gamaleia's work²⁰⁹⁴ is perhaps the most important single contribution of the year to this subject, but serves more especially to emphasize our limited knowledge of it. The author concludes that the toxic action of the bacteria is not linked with the fermentative action, and that it does not coincide with any known diastatic action. The bacterial poisons have been supposed to be "secretions," but this accounts but superficially for their action. Certain pathogenic bacteria produce such diseases as tuberculosis, cholera, and charbon, without the presence of any toxic secretions; again, even the production of poisons in diphtheria and tetanus has a very superficial correspondence to a secretion; in fact, the quantity of these poisons in the culture-liquids is not proportionate to the development of the bacteria themselves. On the contrary, an attentive observation reveals that, at the very first and most active moment of the life of the microbes, the liquid of culture is acid and devoid of all toxic power. Later, when the bacteria have ceased to multiply, and are deposited at the bottom of the culture-flask, the liquid becomes alkaline and very highly toxic, its toxicity augmenting progressively with the length of sojourn of the bacteria in the alkaline

culture liquid. The explanation of this is found in the fact that the poison is contained inside the bodies of the bacteria, and is extracted slowly by the alkaline liquid in which they are macerated. The hypotheses respecting the chemical nature of ptomaines, which identifies them with the constituent parts of the nuclei of the cells, "the vitellines and the nucleines," is thus confirmed. The idea seems to be developing that some of the ptomaines described by various authors were certainly not present in the original fluids, but were the products of the methods of extraction.

Putrefactive bacteria in the human body have been studied by Ottolenghi ⁵⁸⁹ _{Dec. 6, '92} four hours after death, at varying temperatures.

Pyocyanus.—Charrin ¹⁴ _{Apr. 19}, notes a variety of the bacillus pyocyanus, sent to him by Freudenberg, of Berne, which produces the green and blue pigment upon potato. Charrin and Teissier ¹⁴ _{Jan. 26} observed an elevation of arterial pressure in human beings after subcutaneous injections of the toxins of the bacillus pyocyanus. Charrin and d'Arsonval ¹⁴ _{Aug. 13} investigated the condition of the suprarenal capsules in pyocyanic infection, finding them always affected. Charrin and Kaufmann ¹⁴ _{July 26} trace the hypoglycæmia resulting from infection with the bacillus pyocyanus to the effects of the toxins of this bacillus, and Charrin ¹⁴ _{Aug. 20} finds that this toxicity varies with the chromogenic power of the particular culture. D'Arsonval and Charrin ¹⁴ _{Jan. 18} show that its growth is hindered when cultivated in the same culture medium with the torula cerevisia. Ernst ^{2083; 5} _{Oct.} describes a bacillus derived from pericardial fluid that resembles the bacillus pyocyanus, called the bacillus pyocyanus pericarditidis.

Rabies.—Tizzoni and Centanni ⁵⁸⁹ _{Jan. 12} believes that they have definitely shown the transmission of immunity to rabies from parent to young in rabbits.

Saliva.—Fiocca ⁷²⁷ _{p. 223, '92} studied the saliva of the horse, dog, and cat, finding in it a number of pathogenic bacteria.

Secretions.—Sherrington, ²⁴⁷ _{Feb.} in considering the escape of the bacteria with the secretions, says that there is sometimes a transit of the bacteria across the renal and hepatic membranes without detectable transit of the blood, but the evidence is against the belief that where this occurs the membrane is still normal in condition, although at the same time it need not be ruptured or pervious to red blood-corpuscles. Cavazzini ⁸⁵⁴ _{B.A. No. 11} reaches similar results, after experiments with injections of anthrax cultures.

Septicæmia.—Afanassieff, ⁵⁰ Mar. 23 in discussing the confused subject of swine-plague, hog-cholera, etc., describes a new bacterium to be included in the group of so-called haemorrhagic septicæmias.

Skin.—Nikolski ³³⁶ July 22 attempts to locate the varying numbers of bacteria on different parts of the skin of sick persons. Wass-muth ⁵⁰ Dec. 20, 28, '92 concludes that the healthy skin of man and animals may be penetrated by bacteria, but, as he only succeeded in his experiments when rubbing was used, it cannot be said that the penetration occurred under perfectly normal conditions.

Slimy decomposition occurring in certain putrescible fluids is said by Happ ⁵⁰ Aug. 7 to be due to different bacteria. In infusions of senega and digitalis it is caused by a micrococcus.

Sputum-Septicæmia.—Nicola ⁵⁹⁶ Nov., '92 gives the results of attempts to secure immunity against the microbe of sputum-septicæmia by means of injections of cultures of full virulence.

Staphylococci.—Rodet and Courmont ⁹² Feb. 10 have made an important study of the soluble toxic substances elaborated by the staphylococcus pyogenes aureus, finding them multiple, easily destroyed by keeping, even if dry, those precipitable by alcohol being more toxic than those soluble in that fluid. Many other interesting facts are brought out by them. Dor ²¹¹ Aug. 13 showed certain bone-alterations produced by the staphylococcus cereus citreus (?), and Terni ⁵⁸⁹ May 19 succeeded in augmenting the virulence of several of the staphylococci (aureus, albus, and citreus).

Stomach.—Cadéac and Bournay ²¹¹ July 30 find that the gastric and intestinal juices have much less effect (in some cases none at all) upon various pathogenic bacteria than is commonly supposed. Gillespie ²⁴⁷ Feb. found twenty-four varieties of bacteria of the stomach, and also studied their influence in lactic-acid production.

Streptococci.—Roger ⁵⁵ Oct. 8, '92 has studied the modifications in the serum of animals predisposed to streptococcus infection. Marot ¹⁴ Nov. 9, '92 describes a streptococcus of the mouth differing from that of erysipelas by its growth on potato, where it presents milk-white, pin-head colonies after twenty-four to forty-eight hours at 37° C. (98.6° F.). Beck ⁶⁹ p. 902, '92 notes a case, resembling cholera, in which a thorough bacteriological examination showed only streptococci. Knorr ⁵⁸ Mar. 3 studied the streptococcus longus, with a view to determining the possibility of producing immunity from its attacks. Dallemagne ⁸⁶⁸ Mar. 24 recounts a number of cases of internal inflammation

in which the streptococci were active, and Pasquale ⁵³¹_{May, June} undertakes the beginning of a very necessary work,—the comparative study of the streptococci occurring in various situations. Chatin, ²¹¹_{Aug. 20} using “touraillon” for a culture medium, has found streptococci of great virulence in air examined. Goldscheider, ³¹⁹_{Aug. 15}, in discussing the diseases produced by the streptococci, considers that the mode of action of this micro-organism depends upon the accompanying conditions of invasion. Marot ²⁰⁹³ divides the streptococci into two classes: (1) those that give no apparent culture upon potato, which includes most of those already described; (2) those that produce a distinct and visible culture upon potato, which includes a comparatively small number.

Sulphuretted hydrogen, as produced by bacteria, is said by Rubner ³²⁴_{v. 19, p. 53} to be a reduction product, the nascent hydrogen depriving the acids of sulphur.

Suppuration.—Veillon, ³_{Aug. 13}, noting the fact that it is not unusual to find by the microscope that the pus of some abscesses contains bacteria, but that cultures remain sterile, succeeded in cultivating an anaërobic micrococcus from such pus. Suppuration in cattle, investigated by Lucet, ²⁶²_{Apr.} was found to contain special bacteria, described as (1) streptococcus pyogenes bovis; (2) staphylococcus pyogenes bovis; (3) bacillus pyogenes bovis; (4) bacillus liquefaciens pyogenes bovis; (5) bacillus crassus pyogenes bovis. Arloing and Chantre, ³¹_{Sept.} in studying the bacterial origin of surgical purulent infection, say that (1) its essential producing agents are the ordinary bacteria of suppuration (streptococci in the cases observed by them); (2) if other than these bacteria exist in sufficient numbers, they complicate purulent infection, but are not necessary for its development; (3) to produce purulent infection the streptococcus must take on the virulence it possesses in acute and severe forms of puerperal septicæmia, not that manifested in simple or erysipelatous inflammation; (4) the etiological similarities between surgical purulent infection, puerperal septicæmia, and erysipelas are insisted upon, but the place and method of alteration of the pathogenic properties of the streptococcus, permitting it to produce these different clinical appearances, are ignored.

Syphilis.—Pellizari ⁵⁰⁷_{Sept. 192} gives the preliminary results of the protective inoculations of serum of patients in the tertiary stage of syphilis in persons with the initial lesions. The author thinks

that he has secured a diminution of the primary and secondary lesions.

Thermotaxis of bacteria and their behavior toward cold have been studied by Schenk, ^{July 18}⁵⁰ and a number of interesting conclusions reached, which appear to show more clearly than before the intimate relationship between temperature and the growth and virulence of bacteria. "When a person enters a cold room the bacteria in the room move to his warm body, and, finding admission through the skin or otherwise, produce, after a certain time of incubation, the results ordinarily attributed to 'catching cold'; the hair bulb-sheaths, the sweat-glands, and the mucous membrane, all offer possible points of entry to the bacteria."

Tetanus.—Vaillard ^{Oct., '92}²⁸² shows that, though the serum of an immunized animal may have an undoubted antitoxic action as regards the isolated tetanus toxin, it possesses neither a bactericidal nor an attenuating influence on the virus of the disease. Trevisan ⁵⁹⁴_{p. 129, '92} emphasizes the exceedingly important fact of the unaltered virulence of tetanus material preserved in glycerin. Courmont and Doyen ³⁰⁴_{p. 121} consider that the toxic substance which produces tetanus is the result of the action upon the organism of a soluble ferment produced by the tetanus bacillus; and Tizzoni and Centanni ⁵⁸⁹_{Aug. 17} emphasize the importance of the spleen in the experimental immunizing of guinea-pigs against tetanus.

Texas fever and its parasite are discussed by Theobald Smith ⁵⁰_{Apr.} and especial emphasis laid upon the appearance and distribution of the parasite in the red blood-corpuscles.

Tuberculosis.—Pizzini ¹¹⁴_{v. 21, nos. 3, 4} made some interesting observations upon the lymph-glands of persons dead without any clinical evidence of tuberculosis. In twelve out of thirty cases examined microscopically and by inoculation in guinea-pigs, tuberculosis was demonstrated, and the further fact shown that only those guinea-pigs inoculated with the *bronchial* glands showed evidence of tuberculosis.

Macfarland, ⁴⁵¹_{Nov., '92} after an elaborate study of the giant-cell of tubercle, concludes: 1. That giant-cells are cellular monstrosities, accidental and not purposeful, resulting from the overgrowth of epithelial cells. 2. This overgrowth is brought about by mechanical or chemical irritation caused by the presence of a foreign body, whether a living or dead micro-organism or some inert particles.

3. Being the offspring of a cell possessed of amoeboid and phagocytic properties, the giant-cell possesses these properties to some degree, as shown by the injection of foreign particles. 4. Whether living active tubercle bacilli are thus produced must remain *sub judice*. 5. The giant-cell exerts no special deleterious influence upon the tubercle bacillus, but seems instead to be injured by it, a more observable degeneration occurring in those cells which contain many bacilli than in those which contain none. 6. The giant-cell of tubercle does not differ essentially from giant-cells elsewhere, except that it shows a more-marked tendency to undergo cheesy degeneration,—a fact probably due to the peculiar poisonous products of the bacilli in the tubercle. Richet,¹⁴ as the result of some of his experiments, says: “1. Subcutaneous inoculation of avian tuberculosis in monkeys does not excite the development of tuberculosis. 2. Intra-venous injections of a culture of avian tuberculosis produce rapid death in the monkey, by generalized tuberculosis. 3. Previous subcutaneous inoculation of avian tuberculosis *vaccinates* monkeys against avian tuberculosis and makes them refractory to intra-venous injection.”

Vissman,²¹⁶ in writing of the action of dead tubercle bacilli and of tuberculin upon the animal organism, recalls the work of Koch, Prudden, and Hodenpyl. He says: “As tubercle bacilli, though dead and therefore deprived of the power of growth and metabolism, can still originate alterations in the tissues resembling in every detail the structure of a fresh tubercle, and as, further, the elements of these nodules are transferred in their later stages into fibrous tissue, we may assume, with Virchow,²⁰⁹⁵ p.360 that a tubercle is a new formation which starts from connective tissue. This new formation originates through proliferation of the connective-tissue elements induced by the tubercle bacilli acting as an irritating foreign body; the long action of the toxic products of the metabolism of the bacilli kills the young cells, whereby caseation is produced.” An important point has been omitted in these investigations, viz., whether other bacteria treated in the same way would also act as irritant foreign bodies. Roncali⁷²⁷ Jan.1, 192 investigated the inhibitory action of various pathogenic and non-pathogenic bacteria upon the bacillus of tuberculosis, showing that some had a much greater effect than others, but that none were so markedly antagonistic as to enable very definite conclusions to be drawn.

Richet and Héricourt ⁵⁵_{Oct. 22, '92; Nov. 20, '92, Apr. 19} have reached results that seem to show that it is possible to produce immunity to human tuberculosis in dogs by previous inoculation of avian tuberculosis; and Cadiot ¹⁴_{Mar. 29} calls attention to the fact that tuberculosis occurs among dogs much more frequently than is commonly supposed.

Maurel ¹⁰⁸⁸_{Sept. 10-17, '92; Jan. 8, et seq.} has made a series of exceedingly important investigations on the action of tuberculin, and of the action of the bacilli of tuberculosis upon the human blood-corpuscles. His conclusions are as follow: "1. The bacillus of tuberculosis obtained from cultures on nutrient agar is absorbed by the leucocytes, the number taken up by each cell reaching ten, and sometimes over twenty. 2. The leucocytes, however, succumb to this absorption, especially when the bacilli absorbed are numerous. 3. Nevertheless, they are resistant for a certain time, often for several hours. 4. It also appears as if their evolution was not arrested, and that after losing their motion they can carry on this evolution, which is even very active. 5. It must therefore be admitted that leucocytes offer a real resistance to the bacilli of tuberculosis, and what tends to prove this still more is that it is only necessary to attenuate the bacilli slightly in order for the leucocytes to triumph over them completely. 6. The death of the leucocytes, under the influence of the bacilli of tuberculosis, is preceded by the same phenomena as when this occurs from heat or toxic action. 7. It is only the absorption of the bacilli that is dangerous for the leucocytes. In my experiments I have seen them live beside the bacilli, bathed in their soluble products, and yet retaining all their activity, the bacilli themselves not being absorbed. 8. I have not seen the leucocytes attracted or repelled by the bacilli of tuberculosis, although I have watched them for hours. The leucocytes absorb the bacilli when they meet them, neither avoiding nor seeking them. They often pass near them without modifying their direction. I have also observed that those of one part of the experimental field that contained no culture of the bacilli were not attacked by the soluble products to be found after several hours in the other part. It must be concluded then, at least under the conditions of these experiments, that leucocytes are neither attracted nor repelled either by the bacilli or their products. 9. Finally, it appears at least probable that this action of the bacilli on the leucocyte plays a part in the etiology, symptomatology, lesions, and various termi-

nations of the affection. 10. As to the red blood-corpuscles, I have not seen them undergo any special modification, under the influence of either the bacilli or their products. It is to be concluded, therefore, that if these elements undergo any modification they are not such as can be recognized by the methods of experiment employed."

Yamagiva²⁰ and Kitasato⁵⁸ failed to obtain favorable results with tuberculin injections in guinea-pigs. Czaplewski and Roloff⁴ were not quite so unsuccessful, but even their results were not very encouraging. Amann⁵⁰ publishes results of four thousand examinations of sputum, which are extremely useful to those who make such systematic examinations. Christmann,⁵⁰ Mar. 28 studying the action of europhen on the bacilli of human tuberculosis, finds it too slow to promise much. Barry⁵⁰ Apr. 29 reports cases of congenital tuberculosis in calves. Jones⁵⁰ May 29 describes a new fungus occurring in certain tuberculous processes. Cadiot, Gilbert, and Roger¹⁴ note a curious case of tuberculous muscular cirrhosis in a horse, and Solles⁹⁹⁶ Aug. 25 has succeeded in inoculating tuberculosis in a guinea-pig from the spermatic fluid of a tuberculous patient. Hammerschlag,³¹⁹ Sept. 12 as a result of his study of the bacillus of tuberculosis, says that chemical researches on the nature of the bacilli of tuberculosis show that the total of the substances soluble in alcohol and ether comprise at least 27 per cent. This extract is made up of fat, lecithin, and a toxic product that produces the death of rabbits and guinea-pigs, with marked convulsions. The residue, insoluble in alcohol and ether, comprises cellulose and the albumens. The bacteria do not develop well except on media well supplied with hydrocarbons (sugar, glycogen, dextrin), and especially in the presence of glycerin. Nevertheless, it is not possible to demonstrate a consumption of sugar by the bacteria. The filtrate of a bouillon culture, obtained by a Chamberland filter, never produces a toxic effect. When toxic filtrates were obtained, Brieger's method did not isolate ptomaines; it extracted, however, toxalbumens, which appeared toxic for rabbits, and which produced a rise of temperature of 1° to 2° C. (1.8° to 3.6° F.).

Typhoid.—Lesage¹⁴ Dec. 28, 192 reports a case of ganglionic leukæmia, with suppuration of a cervical gland (hypertrophied for several years), in which the typhoid bacillus was the only one found.

Chantemesse and Widal¹⁴ injected the serum of immunized animals into typhoid patients without being able to arrest the disease. Dunbar⁵⁸ makes an interesting research upon the typhoid bacillus and the bacillus coli communis, arriving at the following conclusions as to the methods of isolating the typhoid bacillus: 1. None of the methods used for isolating the typhoid bacillus are of general applicability, most of them hindering the development of other bacteria, whilst the growth of the typhoid bacillus may go on. 2. For the identification of the typhoid bacillus reliance cannot be placed alone upon potato and gelatin cultures and the morphology of the typhoid organism, but the isolated bacilli must also develop in sterilized milk without altering it, and must produce no gas in bouillon. Köhler⁵⁸ writes an interesting paper upon the behavior of the typhoid bacillus toward various chemical agents, especially acids, alkalies, and aniline dyes. Cesaris-Demel and Orlandi,⁷³⁹ in studying the products of the bacillus coli communis and the bacillus of typhoid, conclude "that the products of the two are biologically equivalent, so far as conferring reciprocal immunity, the one for the organism producing the other." Gouget,⁸ Dubief and Bruhl,¹⁴ and Curtis and Combemale¹⁴ have found streptococci in cases of exanthematic typhoid. Ferati³²⁴ emphasizes the growth on acid potato, foul odor, and fermentation production of the bacillus coli communis as differentiating it from the typhoid bacillus. Vittoria¹⁰⁰⁴ mentions three cases in which he seems to have demonstrated the passage of the typhoid bacillus from the mother to the foetus. Geisler⁵⁸⁶ reports one case in which the bacillus of typhoid was excreted in the sweat. Chantemesse and Widal⁴¹⁵ contribute an interesting article upon the injection of the serum of immunized animals in typhoid fever, and are inclined to believe that in the near future successful applications of the methods will be made. Remy and Sugg⁵⁰ discuss the differentiation of the bacillus coli communis and the typhoid bacillus. For the demonstration of the cilia, they use Löffler's mordant in the cold one-fourth to one-half hour, then one-half hour at 37° C. (98.6° F.) in the following solution: To 20 cubic centimetres (5 fluidrachms) of aniline-water are added 5 cubic centimetres (1½ fluidrachms) of a solution of gentian-violet (alcohol, gtt. 2; and aquæ, 10 cubic centimetres—2½ fluidrachms). This avoids all the precipitate usual in the other

methods. Montefusco⁷⁵⁷ makes the statement that low temperatures, alternated with 37° C. (98.6° F.), have no influence upon the vitality, but only hinder the reproduction of the bacilli of typhoid. Its virulence is not affected by low temperatures alternating with 37° C. (98.6° F.), whether the bacilli come from water or faeces. Germano and Maurea,^{589 Sept. 15} as one of the conclusions of their comparative research upon the bacilli of typhoid and similar organisms, mention the important point, too often neglected, that all experiments should be carried on side by side with a well-known culture of the typhoid bacillus.

Urine.—Schow^{50 v.12, p.745} isolated from the urine of a case of compression myelitis a short, thick, motile bacillus capable of generating carbon dioxide, and suggests for it the name of *cocco-bacillus aërogenes vesicae*.

Variations of bacteria are regarded as of great importance by Charrin^{14 Mar. 22} who cites the pigment-production of the bacillus *pyocyaneus* as an illustration.

Variola.—Besser^{50 May 4} has found an undescribed bacillus in small-pox papules, which, pending inoculation experiments, he is inclined to think is the specific organism of that disease. Maljean^{230 Aug.} has made a number of researches upon the bacteria of vaccinia, and especially upon that of red vaccine, which he ascribes to a micrococcus. Ruete^{34 May 23} demonstrated a micrococcus with which on one or two occasions he had succeeded in producing a typhoid vesicle upon calves, the bacteria having been first obtained from calves. Kramer and Boyce^{80 Sept. 15} made some experiments with the serum of animals previously inoculated with cow-pox to determine the nature of vaccine immunity. No definite results were obtained. Siegel^{69 Jan. 12} describes a short bacillus found by him in animals as the result of peritoneal inoculation with diluted calf-lymph, with which he apparently succeeded in producing immunity to cow-pox vaccination in human beings.

Vibration.—Meltzer^{1 Dec. 24, '92} has made a series of interesting experiments upon the importance of vibration to cell-life, by which he seems to show that shaking has a marked destructive effect upon bacteria, this effect increasing the more vigorous the shaking.

Vibrio Avicide.—Bruhl^{126 July 15} adds some very important facts in regard to the life-history of this organism.

Vibrio Danubicus.—This bacterium, described by Heider,^{50 Sept. 11}

is of importance because of its resemblance to the spirillum of Asiatic cholera.

Bacillus Viridans..—An original description of this bacillus was given in 1891, ² Dec. 12, '91 and it is further studied by Summers ² Jan. 21 and Wilson. ² Jan. 23 The latter believes it to be the same bacillus found frequently by him in diphtheritic membrane.

Water..—Lustig's work ²⁰⁹⁶ is useful for those making bacteriological examinations of water. Weibel ⁵⁰ Feb. 8 describes a new vibrio found in well-water, resembling very closely that of cholera; and Bujwid ⁵⁰ Feb. 8 also describes two new spirilla found in water, which he desires to name *bacillus choleroïdes α* and *bacillus choleroïdes β*. Heider, too, ⁸ Nov. 17, '92 describes two new vibrions resembling cholera obtained from Donau canal-water. Landmann ⁴¹ Sept. 14 describes a virulent streptococcus found in drinking-water. Voges ⁵⁰ Sept. 9 gives a very complete and interesting study of the various pigment-producing bacteria that occur in water under the name of *achromatium oxaliferum*, nov. gen., nov. spec. Schewiakoff ⁵⁰ Aug. 1 describes a new organism found in sweet water that resembles the bacteria very closely, but is not one.

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BY N. I. DEVEREUX,

PARIS.

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